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Predatory Strategies and Counterstrategies

Frank H. Easterbrook†

There is a highly competitive market for predatory pricing theories. Scholars have produced a blizzard of rules defining unlawful predatory practices.¹ Some of the rules depend on the relationship between price and cost,² some on the relationship between price and time,³ some on the relationship between quantity sold and time.⁴ One approach eschews rules altogether and suggests that courts examine the totality of the circumstances.⁵ The propo-

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¹ The current round of writing on predatory pricing can be dated from Areeda & Turner, *Predatory Pricing and Related Practices Under Section 2 of the Sherman Act*, 88 HARV. L. REV. 697 (1975). They summarize their position and their responses to critics in 3 P. AREEDA & D. TURNER, *ANTITRUST LAW* ¶¶ 711-722 (1978). Some of the more prominent expositions of the competing positions include Baumol, *Quasi-Permanence of Price Reductions: A Policy for Prevention of Predatory Pricing*, 89 YALE L.J. 1 (1979); R. BORK, *THE ANTITRUST PARADOX* 144-60 (1978); Hay, *A Confused Lawyer's Guide to the Predatory Pricing Literature*, in *STRATEGIC PREDATION AND ANTITRUST ANALYSIS* (S. Salop ed. 1981) (forthcoming); Joskow & Klevorick, *A Framework for Analyzing Predatory Pricing Policy*, 89 YALE L.J. 213 (1979); McGee, *Predatory Pricing Revisited*, 23 J.L. & ECON. 289 (1980); NATIONAL COMMISSION FOR THE REVIEW OF ANTITRUST LAWS AND PROCEDURES, *REPORT TO THE PRESIDENT AND THE ATTORNEY GENERAL* 149-51 (1979); Ordovery & Willig, *An Economic Definition of Predatory Product Innovation*, in *STRATEGIC PREDATION AND ANTITRUST ANALYSIS*, *supra*; R. POSNER, *ANTITRUST LAW: AN ECONOMIC PERSPECTIVE* 84-96 (1976); Posner, *The Chicago School of Antitrust Analysis*, 127 U. PA. L. REV. 925, 939-44 (1979); Scherer, *Predatory Pricing and the Sherman Act: A Comment*, 89 HARV. L. REV. 869 (1976); Scherer, *Some Last Words on Predatory Pricing*, 89 HARV. L. REV. 901 (1976); Williamson, *Predatory Pricing: A Strategic and Welfare Analysis*, 87 YALE L.J. 284 (1977); Williamson, *Williamson on Predatory Pricing II*, 88 YALE L.J. 1183 (1979). Some of my own views on predation have previously appeared in R. POSNER & F. EASTERBROOK, *ANTITRUST: CASES, ECONOMIC NOTES, AND OTHER MATERIALS* 553, 680-89 (2d ed. 1981); Easterbrook, *Predatory Pricing and Innovations: A Comment*, in *STRATEGIC PREDATION AND ANTITRUST ANALYSIS*, *supra*.

² See, e.g., 3 P. AREEDA & D. TURNER, *supra* note 1, ¶¶ 711-722; R. POSNER, *supra* note 1; Joskow & Klevorick, *supra* note 1; McGee, *supra* note 1; Ordovery & Willig, *supra* note 1.

³ See, e.g., Baumol, *supra* note 1.

⁴ See, e.g., Williamson, *Predatory Pricing*, *supra* note 1.

⁵ See, e.g., Scherer, *Comment*, *supra* note 1.

nents of cost-based tests do not agree among themselves. Should the rule depend on marginal, average variable, or average total cost? What is the role of intent, and intent to do what? The most recent approaches propose a collection of cost-based tests; which one applies depends on the structure of the industry and the availability of other strategies that the alleged predator could have pursued.⁶ This explosion in the number of theories raises some fundamental questions. Do we have so many theories because predation is a common but variegated phenomenon, curable by no single antidote? Or do we have so many theories for the same reason that 600 years ago there were a thousand positions on what dragons looked like? Unlike most of the recent writers, I conclude that there is no sufficient reason for antitrust law or the courts to take predation seriously.⁷

Part I of this article considers the nature and potential for success of a number of possible predatory strategies. I conclude that each possible strategy, although superficially plausible, is unlikely to be profitable given the risks faced by the predator and the responses available to rivals. Parts I-A and B discuss the classical model of predation and show that rivals can protect themselves by signing long-term contracts and simply outlasting the predator. Part I-C considers the possibility that predation in one market can be used to send signals to rivals in other markets; it shows that these rivals would not be deterred by such signals, because the predator is threatening to engage in irrational conduct. Part I-D deals with precommitments, such as building substantial excess capacity or redesigning plants to operate with high fixed and low marginal costs, which are said to deter entry. The discussion shows, however, that they would not do so unless very implausible assumptions were accepted. Part I-E then looks at the recent contention that efficient firms should be forbidden to exclude less efficient rivals in some circumstances; it rejects this argument on the ground that the welfare loss from tolerating inefficient production would exceed any welfare loss from a possible monopoly. The

⁶ See, e.g., Joskow & Klevorick, *supra* note 1; Ordovery & Willig, *supra* note 1. If this approach were carried to its logical extreme, it would essentially amount to the adoption of the nebulous approach espoused by Scherer, *Comment*, *supra* note 1.

⁷ R. BORK, *supra* note 1, and McGee, *supra* note 1, also question the need for any rule against predation. But both writers limit their discussion to single markets; neither considers signalling from one market to another or the other predatory strategies that have been discussed in the most recent articles. For a critique of predatory pricing doctrines from a different perspective, see Epstein, *Intentional Harms*, 4 J. LEGAL STUD. 391, 423-41 (1975).

problem of predatory innovations is the subject of Part I-F, which concludes that even in the unlikely event that some innovations were "predatory," there is no satisfactory way to distinguish desirable innovations from undesirable ones. The last section of Part I asks whether the available evidence is consistent with the propositions advanced in the earlier sections and demonstrates that it is.

Part II discusses the way in which remedies could be devised for predation if it existed. I show that it is all but impossible to imagine an optimal damages remedy for predation. The crude proxy measures now employed in litigation create incentives for too many suits by firms disgruntled by the rigors of competition. Even a small rate of error in these suits creates a significant penalty on hard competition. Part II concludes that, if there is to be any remedy for predation, damages should be limited to the harm suffered by consumers during the monopoly captured by the predator. Suits by competitors should not be entertained.

Finally, Part III discusses the costs involved in litigating about predation. Predation cases are extraordinarily complex, because each presents questions concerning market definition and share as well as the costs of production. I contend in Part III that the total social costs of predation—welfare loss from monopoly plus the loss from deterring competition through an antipredation rule and the costs of administering such a rule—would be minimized by declaring low prices lawful *per se*. The theoretical case for a rule against predation is too weak, the damages measures too inaccurate, and the administrative costs too high to justify intervention designed to control the prices charged by rivals.

I. PREDATORY STRATEGIES

A. When is Predation Profitable?

One of the lessons supposedly learned from observing the great trusts is that large firms with deep pockets can drive rivals out of business by cutting prices. It was commonly thought that the Standard Oil Trust, for example, engaged in extensive predation. By cutting prices, it drove rivals into bankruptcy. Then it bought its rivals' assets for a song and dismantled their plants. Although the Supreme Court never addressed the legality of this conduct, it clearly assumed that predatory pricing is unlawful because it is an effective tool of monopolization.⁸ Congress enacted section

⁸ *Standard Oil Co. v. United States*, 221 U.S. 1, 47, 76 (1911). Soon after, *Louis D.*

2 of the Clayton Act⁹ out of the same belief that predation is effective.¹⁰

The problem with any attempt to penalize predation, however, is that it is exceedingly hard to distinguish "predatory" strategies from ordinary competition. The antitrust laws are designed to maximize welfare by protecting competition, not competitors.¹¹ A practice that injures competitors is thus of no antitrust concern unless it also reduces consumers' welfare. In any economy except a static textbook model, prices and output always are adjusting to changes in supply, demand, and the costs of production. Prices and quantity supplied fluctuate. Firms plan new plants in anticipation of changes in demand, or just to guard against breakdowns. A firm that learns how to reduce its costs can expand at the expense of its rivals. All of this is natural and desirable, notwithstanding the possibly adverse effects on some firms and their owners.¹²

An argument that a practice is "predatory" is likely to point to exactly those things that ordinarily signify efficient conduct. A plaintiff charging predation will classify a reduction in price, an

Brandeis called cutthroat prices "the most potent weapon of monopoly." L. BRANDEIS, *COMPETITION THAT KILLS IN BUSINESS—A PROFESSION* 236, 254 (1914). See also Edwards, *Conglomerate Bigness as a Source of Power*, in *BUSINESS CONCENTRATION AND PRICE POLICY* 331, 334-35 (National Bureau of Economic Research ed. 1955), for a restatement of this view.

⁹ 15 U.S.C. § 13 (1976).

¹⁰ H.R. REP. NO. 627, 63d Cong., 2d Sess. 89 (1914); see *FTC v. Anheuser-Busch, Inc.*, 363 U.S. 536, 543 & n.6 (1960).

¹¹ There has been a substantial debate about the purposes of the antitrust laws; opinions of the Supreme Court appear to support all conceivable positions, as do snippets of the legislative history. I agree with Robert Bork that, whatever one makes of this history, the antitrust laws should be treated as if they served no goal other than economic efficiency. R. BORK, *supra* note 1, at 15-89. Any other approach renders the statutes incomprehensible. See also 1 P. AREEDA & D. TURNER, *supra* note 1, ¶¶ 103-113. The Supreme Court appears recently to have adopted Bork's position. See *Reiter v. Sonotone Corp.*, 442 U.S. 330, 343 (1979) ("Congress designed the Sherman Act as a 'consumer welfare prescription'" (quoting R. BORK, *supra* note 1, at 66)); *Broadcast Music, Inc. v. Columbia Broadcasting Sys., Inc.*, 441 U.S. 1, 7-8, 19-20 (1979); *National Soc'y of Professional Eng'rs v. United States*, 435 U.S. 679, 689-92 (1978); *Continental T.V., Inc. v. GTE Sylvania Inc.*, 433 U.S. 36, 53 n.21 (1977).

¹² Williamson argues that rules against predation should assure "fairness." Williamson, *Predatory Pricing II*, *supra* note 1, at 1197. This assumes that some amount of efficiency should be sacrificed to "fairness" but does not specify how the trade is to be made, or why the antitrust laws are appropriate instruments for making such decisions. Williamson's position is inconsistent not only with the proposition that the antitrust laws should be used to maximize society's wealth but also with a long tradition in the common law. For hundreds of years it has been clear that a business has the privilege to destroy its competitors, so long as the destruction is the result of competition in the market. See *Mogul S.S. Co. v. McGregor, Gow & Co.*, 23 Q.B.D. 598 (1889), *aff'd*, [1892] A.C. 25 (1891); O. HOLMES, *THE COMMON LAW* 144-45 (1881); Epstein, *supra* note 7, at 423-43.

expansion in output, the building of a new plant, and so on as proof of the defendant's villainy. Unless we have some powerful tools to separate predation from its cousin, hard competition, any legal inquiry is apt to lead to more harm than good.¹³ Given the general agreement that almost all price reductions, sales increases, additions to capacity, and so on are beneficial, we need a very good ground indeed to treat a particular instance of such conduct as unlawful. The proponent of legal intervention must bear the burden of supplying such a ground.

There are several necessary conditions to such a demonstration. First, the plaintiff must show that the challenged practice reduced consumers' welfare. The conduct assigned as "predatory" must, therefore, lead to a monopoly. We can dismiss out of hand cases in which the predator never achieves that goal, for such ineffectual conduct occasions no loss to consumers; a price reduction not leading to a monopoly, for example, simply benefits consumers by saving them money. A second necessary condition is that the predation be profitable to the predator. The antitrust laws are not designed to outlaw all welfare-reducing acts. They serve, instead, to compel firms to bear the full social costs of their practices. As Part II demonstrates, optimal antitrust penalties deprive firms of any profits obtained by violating the rules and force them to pay a fine equal to the reduction in consumers' welfare caused by their conduct. But if firms make no profit from particular conduct, and if in addition they bear the consumers' losses as private costs, there is no need for the legal system to step in. To put the point differently, if the market forces a firm to bear the full costs of its conduct, it imposes an automatic fine and makes the conduct self-detering.

For example, suppose Exxon decides to demolish a profitable

¹³ This concern informs the rules proposed by Areeda & Turner, *supra* note 1, and to a lesser extent, the proposals of Joskow & Klevorick, *supra* note 1. One court has declined to follow the Areeda and Turner proposals precisely because they were designed both to reduce the chance of falsely condemning hard competition and to hold administrative costs to a minimum. The court reached this conclusion because, it said, "Section 2 of the Sherman Act makes no exceptions for cases involving administrative difficulty." *Chillicothe Sand & Gravel Co. v. Martin Marietta Corp.*, 615 F.2d 427, 432 (7th Cir. 1980). The district court in *In re IBM Peripheral EDP Devices Antitrust Litigation* (Transamerica), 481 F. Supp. 965, 993-95 (N.D. Cal. 1979), *appeal docketed*, No. 80-4048 (9th Cir. Jan. 31, 1980), took a similar position. The view is difficult to take seriously. Antitrust is filled with per se rules, all adopted for the purpose of making litigation less costly and more predictable. As I discuss in Part III *infra*, the rationale of per se rules supports a rule that price reductions are lawful per se.

refinery. The demolition destroys resources and clearly reduces welfare. Putting aside questions of fraudulent claims on insurance companies and the possibility that the demolition is part of a cartel's plan to reduce output, there is no reason for the legal system to penalize Exxon's conduct. The demolition is unprofitable; deterrence is thus built in. It would be foolish to devote additional resources to preventing conduct that penalizes itself.¹⁴ For the same reason, the antitrust laws do not penalize the introduction of unsuccessful products. Firms constantly bring to market—at a great cost—products that few people are willing to buy. Once the firms discover this, they withdraw the products and write off their losses. Product failures waste the resources the firms have invested, but antitrust law does nothing about this wasteful conduct. Firms take account of the chance of failure as a built-in penalty for introducing undesired products; because the firms bear the costs of their conduct, the legal system need not add to the penalty. It follows, then, that antitrust law should ban only those predatory practices that reduce efficiency yet are profitable to the predators.

Cartels and other monopolistic practices are immediately profitable; firms raise price and collect the returns at once. Predation, by contrast, involves a sacrifice of profit over the short run in order to create a monopoly and charge a supracompetitive price in the future. The predator must make a substantial investment with no assurance that it will pay off.

It is conceivable that predation could be profitable. Short-run sacrifice for later reward often is a rational way to maximize profits, as in advertising a new product or training a staff of employees. The question, though, is whether profitable predation is probable. John McGee's seminal article in 1958 established that profitable predatory price cutting must be unusual.¹⁵ Price reductions are very costly to the predator, which forgoes the difference between the competitive and the predatory price. Once the predator has cut price, it must sell more in order to clear the market. These additional units ordinarily must be produced at a higher marginal cost per unit. The larger the predator's market share, the faster it loses money. Rival firms do not suffer the same loss; they can cut back

¹⁴ If costs played no role in the decisions of Exxon's managers they would not be deterred. But if they exhibited such irrationality there still would be no point in invoking the antitrust laws. If the managers did not respond to the cost of destroying the refinery, they would not respond to the cost of paying a fine.

¹⁵ McGee, *Predatory Price Cutting: The Standard Oil (N.J.) Case*, 1 J.L. & ECON. 137 (1958).

production, and even if they do not do so they will typically be producing only a fraction of the market's total output.

What does the predator get for its trouble? It must try to recoup its loss by charging a monopoly price after the victim has been driven from the market. But any low-price-now, high-price-later strategy is subject to countermeasures. The predator can recoup only if the customers, the ultimate victims, cooperate. If the customers act rationally they will stock up, during the low-price predation period, with much of what they expect to use during the recoupment period.¹⁶ If they do so, there can never be a recoupment period. The predator may respond by limiting the quantity it offers at a low price, but then the market will not clear. This decreases the pressure on the intended victim. If the predator declines to sell all that customers demand at the low price, the victim can make up the difference by supplying additional units at a higher price.¹⁷ A predator that puts a cap on sales thus predares against itself.

In many markets stockpiling is not possible.¹⁸ Perhaps, too, customers will not recognize that a given price reduction is caused by predation. Even so, the predator faces still another problem in trying to recoup: the victim may not leave the market. The predator's rival, after all, has the same incentive as the predator to ride out the price war and collect monopoly profits once one of them has collapsed. Investors should be willing to back the intended victim, because it would be the more profitable survivor, having sustained smaller losses during the fight. (The predator

¹⁶ The customers must finance this inventory, but they should be able to do so at the prevailing rate of interest. Indeed, because such loans would be secured by the value of the stockpiles, the customer should have access to money at a lower rate of interest than the predator, whose investment in predation is highly speculative.

¹⁷ The predator, selling at the lower price, will make the first sales. This will leave the victim with a residual demand, computed by subtracting from the market demand curve the amounts supplied at particular prices by the predator. The residual demand available to the victim will depend on how much the predator falls short of supplying the market-clearing quantity at the predatory price. The actual computations are unimportant here, however, because any time the predator curtails supplies by enough to cut its losses, a victim will find some demand for its product at profitable prices (providing its own costs are as low as the predator's).

¹⁸ Stockpiling of perishable goods is not possible. It may appear that services cannot be stockpiled, but this is misleading. The equivalent of stockpiling is a long-term service contract. If the predator will not provide such contracts, then predation cannot drive the intended victim from the market, because the victim will provide them, *see text at notes 19-20 infra*. And if the predator does provide long-term contracts at the predatory price, then it cannot recoup.

loses more money because it must expand sales to meet demand at the low price.) A "deep pocket" predator may draw on internal sources to finance the war. This would appear to give it an advantage in the struggle by allowing it to avoid interest costs and the like. But these internal sources are not really free; the predator must take into account as a cost the fact that these funds could have been put to other uses. The predator's cost is what the funds would have earned in alternative endeavors, which would presumably at least equal the costs of borrowing. On the other hand, a large bank should have no hesitation in lending to the intended victim. True, the victim may fail, but the loan itself reduces that risk, and the bank, with a diversified portfolio of loans, could charge a suitable rate of interest and be indifferent to the remaining risk. Moreover, even if some intended victims cannot find adequate financing—and no theory of predation has explained *why* victims should lack access to capital—the predator cannot take comfort. Larger firms with their own deep pockets could acquire the intended victim, or diversified firms could enter the market themselves. There is no reason why the capital market should refuse to supply funds to the victim, but even if it does so the predator can succeed only if mergers with failing (victim) firms are unlawful and the victim has some unique attribute that new entrants cannot duplicate.

Suppose, however, that capital markets are closed to the victim, mergers are unlawful, and new entrants cannot be found. The intended victim has still another resource. It can turn to its customers for assistance. Because customers are the ultimate victims of the predator's future monopoly prices, they should be willing to help the intended immediate victim. The easiest way is to continue to buy at the old price, spurning the predator's lower-price offer. This initially seems implausible, because any one customer would be too small to ensure the survival of the victim; each customer thus would buy the predator's low-priced goods, attempting to take a free ride on those who supported the victim.¹⁹ But the victim can solve the free-riding problem by offering long-term contracts at the competitive price, which would be less than the price the predator

¹⁹ See Posner, *Exclusionary Practices and the Antitrust Laws*, 41 U. CHI. L. REV. 506, 515-16 (1974), for a brief analysis of customers' responses to predation. *Pacific Eng'r & Prod. Co. v. Kerr-McGee Corp.*, 551 F.2d 790, 794 (10th Cir.), cert. denied, 434 U.S. 879 (1977), provides a vivid example of these responses. Customers gave the intended victim "stay alive" orders at more than the "predator's" price in order to preserve competition.

would charge if it obtained a monopoly. Once the victim has assured its continuity through long-term contracts, the predator should cease offering the predatory price. (If it continues, it is simply squandering its wealth.) Thus each customer signing the contract makes itself better off by precluding future monopoly pricing. At the same time, the free-riding problem vanishes. The customers signing the long-term contracts are not giving other customers any advantage, for all customers will receive the same (competitive) price at the same time.

If any customer is worried that it will have to forgo low prices while the victim is setting up a network of contracts, thus giving its competitors an advantage, the victim can make the effectiveness of the contract contingent on obtaining enough commitments to support use of its entire production capacity. Once that has been accomplished, and the intended victim's survival assured, the contracts would go into effect and the predation would end nearly simultaneously. When the ultimate consumers purchase infrequently, as in the retail market for television sets, they would be protected by warehousemen, retailers, and other distributors, which would sign long-term contracts in order to assure their own supply at the lowest possible prices. If customers frequently enter and leave the markets, the contracts could be made truly long term by providing that the right to purchase is assignable from one customer to another. The point is this: as long as victims and customers have rational expectations about the future conduct of predators, and the predators themselves behave rationally, the intended victim should always be able to offer some package that is more attractive to customers than the monopolist's offer of low prices followed by monopoly prices. Potential predators will understand that victims can make these responses, and thus they will not make predatory threats.

If rational expectations are uncommon, and the victim cannot obtain access to capital or sign long-term contracts with customers, it may be required to quit the market. It also would leave if it could shift easily from making one product to making another that is not subject to predation. But whether the victim turns its attention elsewhere or declares bankruptcy, the predator has won only a battle, not the war. The assets of the victim are not lost. New owners may buy the plant of the bankrupt victim for a pittance, reflecting the victim's apparent inability to make a profit. These new owners have lower average costs than the predator, because their plant cost less, and so over the long run they could undersell the

predator. If the victim turned to other products, it would be attracted back to its original market once the predator tried to make a monopoly profit. In either event, recoupment seems highly unlikely.

The predator therefore can make a profit from its predation only if the victim's assets are scattered as a result of liquidation and barriers to entry protect the predator's monopoly. Although barriers to entry and postpredation monopoly are necessary to recoupment,²⁰ they are not sufficient. Money earned in the future, after the victim has collapsed, must be discounted to present value and compared with the present value of the income forgone during the predation. The predator must discount the future earnings even further because of the risk that demand will change, the barriers to entry may be altered, or other things may go wrong. This risk of failure in recoupment must be added to the risk that the victim will outlast the predator. Because the losses during the predation may be large, and the risk of nonrecoupment great, even the ability to collect a monopoly profit after knocking the victim out of the market may not be enough to make the predation profitable when evaluated *ex ante*.

For example, start with a predator that not only has 75% of a market but also has lower costs than its rival. Both firms sell gizmos, and each has fixed costs of \$1,000 per year.²¹ Table 1 shows the marginal costs of the firms. The annual demand for gizmos is shown in Table 2. This demand schedule does not move with the onset of predation. In other words, consumers do not stockpile gizmos. (Stockpiling would cause the demand to increase at any given price, because the demand schedule then would contain demand not only for current use but also for future use.) I disregard

²⁰ See Joskow & Klevorick, *supra* note 1, at 225-31, 242-49. See also 3 P. AREEDA & D. TURNER, *supra* note 1, ¶ 711b. It is important not to confuse "barriers to entry" with high cost of entry or with efficient techniques of production. On occasion, the Supreme Court has intimated that efficient production by an incumbent firm is a barrier to entry. See *FTC v. Procter & Gamble Co.*, 386 U.S. 568, 578-79 (1967). That view, if it ever was the law, has been abandoned. *Brunswick Corp. v. Pueblo Bowl-O-Mat, Inc.*, 429 U.S. 477, 488 (1977). It is best to distinguish clearly between barriers to entry (costs of production that face the entrant but not the incumbent) and entry hurdles, which are one-time expenses that any firm must incur in order to enter. See G. STIGLER, *THE ORGANIZATION OF INDUSTRY* 67-70 (1968); Ordovery & Willig, *supra* note 1; Salop, *Strategic Entry Deterrence*, 69 AM. ECON. REV. 335 (May 1979); von Weizsäcker, *A Welfare Analysis of Barriers to Entry*, 11 BELL J. ECON. 399 (1980).

²¹ The assumption of "yearly fixed costs" is equivalent to the assumption that each firm's plant, with a useful life of one year, costs \$1,000 to build.

TABLE 1
MARGINAL COST PER GIZMO

Units	Predator	Victim
1-1000	\$3	\$3
1001-2000	2	4
2001-3000	1	5
3001-4000	2	6
4001-5000	3	7
5001-6000	4	8
6001-7000	5	9
7001-8000	6	10
8001-up	7	10

TABLE 2
DEMAND FOR GIZMOS

Price Per Gizmo	Units Purchased
\$3	12,000
4	8,000
5	7,000
6	6,000
7	5,000
8	4,000
12	2,000

stockpiling and have given the predator a less efficient rival in order to make the example as favorable as possible to the predator.

With the demand given in Table 2, the market clears in competition at a price of \$4 per gizmo, and 8,000 gizmos will be purchased per year. The predator will supply 6,000 units and the victim 2,000. The total costs of the victim are \$8,000 (\$1,000 fixed costs, 1,000 units at a marginal cost of \$3 each, and 1,000 units at \$4 each), which equals its income for 2,000 units sold at \$4, so it makes no economic profit. The predator has costs of \$16,000 and

income of \$24,000 on its 6,000 sales, so it has an economic profit of \$8,000.

In order to drive the victim out of business, the predator drops price to a point infinitesimally below \$3 per gizmo. At this price the market demands 12,000 units per year. The victim will suspend production, both because sales at \$2.9999 per unit do not cover its marginal cost and because it knows that shutting down will require the predator to supply the entire demand, increasing the predator's loss. The predator's costs will be \$55,000 and its revenues \$36,000. That is an out-of-pocket loss of \$19,000, but the predator's real loss is \$27,000, because it forgoes the \$8,000 it would have made if it had left the price at \$4 per gizmo. Its rival, meanwhile, loses only \$1,000 per year, so the predator loses 27 times as much as its "victim." At the end of the year of predation the victim dies and its productive assets vanish. (Again, I have made the example especially favorable to the predator, for the victim ordinarily would attempt to survive into the recoupment period and so share in the monopoly profits.)

Can the predator recoup the loss? The stream of monopoly profits must be discounted to present value. If the present value of that stream is larger than \$29,123.72 the investment is profitable.²² If the discount rate is 15% and the predator, after eliminating the victim, has a guaranteed monopoly for 10 years, then it must receive a return of \$13,802.96 in each of those years for the predation to be profitable. That covers the \$8,000 profit the predator would have had without the predation, plus the \$5,802.96 additional profit necessary to make up for the losses incurred during the price war.²³ The monopoly output in the gizmo market is between 4,000 and 5,000 units per year. At an output of 4,000 units, the predator has costs of \$9,000 and revenues of \$32,000; at 5,000 units the cost is \$12,000 and the revenue \$35,000. In either event, the predator

²² The figure is not \$27,000. That sum was being invested in predation continuously throughout the year, and the predator lost the interest it could have received. If an equal amount is invested each day, then by the end of the year the value of the total amount invested is \$29,123.72, assuming a discount rate of 15%.

²³ The usual way of determining whether an episode of predation is profitable is to determine the present value of the predatory investment and anticipated monopoly returns as of the day the predation commences. I have followed a slightly different path—computing the size of the predatory investment and the present value of returns as of the day the predation ends—in order to distinguish clearly the effects on returns of different circumstances. The two methods are equivalent.

collects a monopoly rent of \$23,000, which apparently is more than sufficient to make the venture worthwhile.

But if we introduce uncertainty the picture changes. Suppose that the predator calculated there was only a 50% chance that it would eliminate the victim (or that it could establish a monopoly). In order to be indifferent between the certain loss and the hope of profit, the predator must treat his investment in predation as twice its actual size.²⁴ In the example, if the probability of recoupment is one-half and the recoupment period 10 years, the predator still makes a profit. If the monopoly could not be maintained for more than 6 years, though, the profit vanishes.

To put the matter slightly differently, if the predator is certain that it can wipe out the victim and become a monopolist, then it breaks even if it can collect a monopoly profit for 2.46 years. If there is only a 50% chance that it will recoup the loss, the monopoly must last 6.25 years to make the predation an even bet. If the probability of doing away with the victim and obtaining a monopoly is less than 29%, not even a perpetual monopoly will provide a profit for the predator. Predation thus is not a very good gamble, because it is quite unusual for a firm without a patent to hold a 100% market share *and* charge a monopoly price for very long; surely 6 years would be extraordinary. At the monopoly output in the example, the predator's marginal cost is \$4 and it sells for \$7. That is an exceedingly large gap, quite likely to attract entry even if barriers are significant.

Even if recoupment were certain, and the monopoly guaranteed for 10 years, the present value to the predator of this stream of profits would be only \$8,516.80, equivalent to a return of 29% on the money it "invested" in the predatory campaign. Because this return is available only on the most implausible series of assumptions—no stockpiling, no long-term contracts, certain death for the inefficient victim, no new entry for 10 years—it is quite unlikely that a potential predator would prefer this highly risky return to that available in other endeavors more likely to pay off.

Much of this is familiar ground to a reader of the literature on predation written between 1958 and 1975.²⁵ True, there were flaws

²⁴ I assume here that the predator is risk neutral. If, as is sometimes argued, firms are risk averse, then the predator would demand additional compensation for the riskiness of a predatory campaign.

²⁵ See also R. BORK, *supra* note 1, and McGee, *supra* note 1, for more recent arguments related to those I have made here.

in McGee's original argument;²⁶ he neglected the possibility that the victim might have higher financing costs than the predator, and he emphasized predation's unprofitability when compared with merging as a method of monopolization. Some critics pointed out that mergers to monopoly are unlawful and contended that McGee's analysis therefore fails.²⁷ But the profitability of predation vis-à-vis mergers is not critical to the argument that predation almost always is unprofitable. The arguments I have made above do not depend in any way on the lawfulness or profitability of mergers.

When Areeda and Turner entered the debate in 1975, they made no serious effort to determine whether welfare-reducing predation is common or profitable. Instead, they attempted to define a set of rules that would enable courts to distinguish price cuts that reduce efficiency from those that increase efficiency. They proceeded, in other words, on the assumption that there was an adequate reason to undertake the inquiry in the first place.²⁸ The replications and rejoinders that have followed Areeda and Turner's article also bypass the question of whether predation is likely to be a serious problem. Yet unless there is reason to think that predation is a substantial problem, the debate about how best to express the legal rule defining it is irrelevant. Therefore it is important to consider the various approaches suggested recently, in order to see whether any of them establishes the existence and significance of the phenomenon it defines. The remaining sections of Part I examine the possible predatory strategies to determine whether any one of them is likely to pose a substantial threat to consumers' welfare.

B. Short-Run Welfare Maximization and Predation

The approaches to predation that have attracted the most attention emphasize microeconomic theories of wealth maximization. They concentrate on the behavior of firms in single markets, and

²⁶ See McGee, *supra* note 15.

²⁷ See, e.g., R. POSNER, *supra* note 1, at 185-86; Williamson, *Predatory Pricing*, *supra* note 1, at 286-87. Telser, *Cutthroat Competition and the Long Purse*, 9 J.L. & Econ. 259 (1966), was concerned exclusively with predation versus mergers, and the challenge to his conclusions is thus especially strong.

²⁸ See Areeda & Turner, *supra* note 1. Indeed, they now state that they doubt that predation is frequent. 3 P. AREEDA & D. TURNER, *supra* note 1, ¶ 711b. They nonetheless conclude that, because predation sometimes is profitable, and because all sales below cost sacrifice welfare, there should be legal rules against the practice.

they ask whether certain conduct is inconsistent with competition. A firm operating in a competitive market sells at marginal cost; anything else is foolish, because the firm could increase its profits by adjusting its output. Setting a price at less than marginal cost therefore appears to be predatory. What else could explain the departure from the competitive norm? Areeda and Turner emphasize this reasoning as the basis of their approach, although they would permit courts to use average variable cost as a proxy for marginal cost.²⁹

In a competitive market, price equals average total cost as well as marginal cost. A price higher than marginal cost but lower than average total cost cannot be sustained indefinitely, because the firms setting such a price cannot replace their plant as it wears out. Moreover, no profit-maximizing firm adds to output without expecting to recover the long-run incremental costs of the decision. Because marginal cost ordinarily equals average total cost at the competitive output, any price satisfying a marginal cost test also satisfies an average total cost test. But marginal cost could legitimately be lower than average total cost if demand were declining (so that the firms were disinvesting), or if firms had not yet fully realized economies of scale. Prices below average total cost might also be justified if firms were learning how to make a product and anticipated that selling additional units—even at prices that did not cover average total costs—would enable them to reduce costs in the future. By formulating a rule that would ban all sales at less than average total cost if the price cutter intends to predate, Richard Posner has attempted to capture the fact that prices usually equal or exceed average total cost, and that sometimes they should not do so.³⁰

Almost all recent cases adopt these tests or some variant of them.³¹ But the approaches to predation that focus on the way in

²⁹ See 3 P. AREEDA & D. TURNER, *supra* note 1, ¶ 715b.

³⁰ See R. POSNER, *supra* note 1, at 189.

³¹ See, e.g., *Pierce Packing Co. v. John Morrell & Co.*, 633 F.2d 1362, 1367 (9th Cir. 1980); *National Distrib. Co. v. United States Treasury Dep't*, 626 F.2d 997, 1017 n.64 (D.C. Cir. 1980); *Janich Bros., Inc. v. American Distilling Co.*, 570 F.2d 848, 855 (9th Cir. 1977), *cert. denied*, 439 U.S. 829 (1978); *Americana Indus., Inc. v. Wometco*, 556 F.2d 625, 627-28 (1st Cir. 1977); *Pacific Eng'r & Prod. Co. v. Kerr-McGee Corp.*, 551 F.2d 790 (10th Cir.), *cert. denied*, 434 U.S. 879 (1977); *International Air Indus., Inc. v. American Excelsior Co.*, 517 F.2d 714, 722-26 (5th Cir. 1975), *cert. denied*, 424 U.S. 943 (1976); *Telex Corp. v. IBM*, 510 F.2d 894 (10th Cir.), *cert. dismissed*, 423 U.S. 802 (1975). *But see* *Chillicothe Sand & Gravel Co. v. Martin Marietta Corp.*, 615 F.2d 427, 432 (7th Cir. 1980); *In re IBM Peripheral EDP Devices Antitrust Litigation* (Transamerica), 481 F. Supp. 965 (N.D. Cal. 1979),

which departures from short-run profit maximization look suspicious disregard a critical problem: how can setting a low price profitably induce the exit of a rival?³² Unless low prices induce exit and leave the predator with a profit, there is no need for a legal remedy. Areeda and Turner do not explain why predation ever is profitable; indeed, although they specify certain "preconditions" to profitable predation (quick exit and barriers to entry that protect the ensuing monopoly), their proposed rule does not incorporate these preconditions.³³ Posner argues that one firm's setting a price below average total cost might lead a more efficient rival to exit, thus creating a social cost not borne by the predator. But he does not explain why the predator, which is losing money faster than its more efficient rival, would not depart first.³⁴

There is, however, one possible defense of these approaches. Areeda and Turner observe that departure from marginal cost pricing is itself a misallocation of resources and argue that this supports a legal prohibition.³⁵ An example may be helpful. If the marginal cost of baking a pound of crackers is \$1.00, the price in a

appeal docketed, No. 80-4048 (9th Cir. Jan. 31, 1980); and *Borden, Inc.*, 92 F.T.C. 669, 803-05 (1978), *appeal docketed*, No. 79-3028 (6th Cir. Jan. 12, 1979), all of which criticize marginal cost based approaches.

³² See Joskow & Klevorick, *supra* note 1, at 222-23; Posner, *supra* note 1, at 940 n.46; Williamson, *Predatory Pricing II*, *supra* note 1, at 1184-86.

³³ Compare 3 P. AREEDA & D. TURNER, *supra* note 1, ¶ 711b (stating the prerequisites) with *id.* ¶ 711d (stating the proposed rules). A plaintiff could establish a violation of the rules in ¶ 711d without proving that the victims of predation were unable to obtain financing, that they left the market, or that barriers to entry would have protected the monopolist after exit of the victims. Areeda and Turner acknowledge, *id.* ¶ 711b, that "the prospects of an adequate future payoff . . . will seldom be sufficient to motivate predation," but they define "predation," the punishable offense, in a way that excludes reference to motive or profitability.

³⁴ See R. POSNER, *supra* note 1, at 187-91. McGee, *supra* note 1, at 300-04, makes the same observation and provides an argument that the "predator" always would quit first if faced with a more efficient rival. Posner probably would object that McGee overlooks the possibility that the victim, albeit more efficient, might be unable to obtain the capital necessary to survive the predation. Lack of access to capital plays an important role in any non-strategic approach to predation. See Posner, *supra* note 1, at 939. I have already indicated why lack of access to capital is unlikely to be a serious problem: customers could provide the necessary financing through long-term contracts. Moreover, even if firm A lacks the necessary capital or financing, it is not clear why firms B, C, . . . N would share the same disability. Unless the capital-poor victim is unique in its ability to produce as cheaply as the predator, and capital-rich firms cannot acquire the victim by merger, there is little cause for concern that a predator could eliminate a more efficient rival.

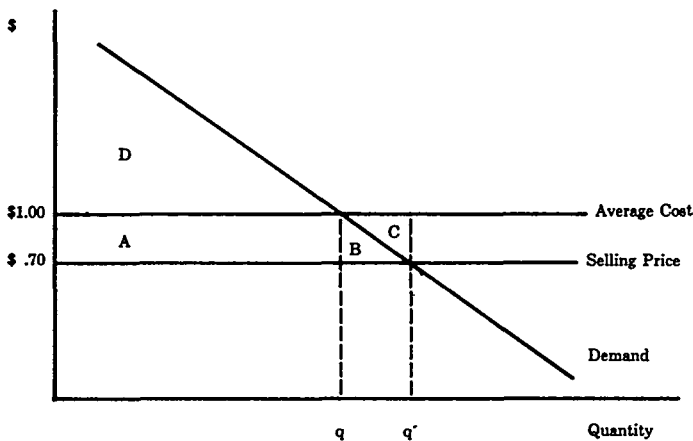
³⁵ See 3 P. AREEDA & D. TURNER, *supra* note 1, ¶ 711a ("A firm which drives out rivals by selling at unremunerative pricing is not competing on the merits . . . There is, therefore, good reason for including a 'predatory pricing' offense" among the antitrust rules.); *id.* ¶ 715b.

competitive market would also be \$1.00. If bakeries, for any reason, reduced the price to \$.70, then persons who valued crackers at more than \$.70 but less than \$1.00 would start buying them. This would reduce welfare, because these consumers would receive less than \$1.00 of benefit from crackers whose manufacture consumed \$1.00 in resources. A rule against sales below marginal (and thus average total) cost would prevent the loss.

This approach, of course, has nothing to do with monopolies or monopolization. It would therefore be legitimate to object that it has nothing to do with antitrust law, which cannot address all welfare-reducing activities. It is enough that here, as with the destruction of Exxon's refinery posited earlier, the firms bear as private costs the entire welfare loss created by their activities.³⁶

Why this is so can be most easily explained by use of an illustration. Figure 1 depicts the situation of sales below marginal cost, which I assume is equal to average cost as well. If bakeries sold

FIGURE 1



crackers at \$1.00, consumers would purchase quantity q . Everyone who valued crackers at \$1.00 or more a pound would buy, and no one who valued a pound at \$.99 or less would buy. Bakers would recover exactly their costs. Consumers would realize a surplus indicated by area D, which is the value they place on the crackers less the purchase price. If bakers cut the price to \$.70, then consumers would purchase q' of crackers. There would be a welfare loss equal

³⁶ I am indebted to William M. Landes for this point.

to area C, which represents the value lost in purchases by consumers who would be unwilling to pay what it cost to produce the crackers.

Welfare losses of this sort are pure waste. But the mere existence of waste is not a sufficient foundation for a legal rule. Notice that consumers experience no loss. They are in fact considerably better off than they were when the price was \$1.00 and the surplus was only area D. When the price is set at \$.70, the consumers' surplus is equal to areas A + B + D. The welfare loss therefore falls entirely on the shareholders of the bakeries, which lose 30 cents times q' pounds of crackers. The bakers thus lose a sum equal to A + B + C; they lose A on the price reduction for existing (q) sales, and they lose B + C on the incremental sales. The bakers' losses are several times greater than the welfare loss. This loss is imposed automatically, by operation of the market. Perhaps the bakers' shareholders should have a remedy, but that is not an antitrust problem. The bakeries bear costs far exceeding the optimal penalty for the offense.³⁷ There is no need for an antitrust remedy, because the conduct is self-detering. The market imposes an ample penalty on any firm that tries to drive out a rival but fails. The costs of mobilizing the legal system and extracting a penalty would be a deadweight social loss, adding to the loss (area C) that has already been sustained. This analysis applies not only to sales below marginal cost but also to any case of attempted but unsuccessful predation.³⁸

A predator's malicious intent could not increase the economic effects of its conduct. The optimal penalty for intentionally selling below cost is therefore the same (zero) as the penalty for unintentionally doing so. Posner introduced his intent test only to narrow a rule that otherwise would have swept up a good number of desirable pricing policies.³⁹ Even so limited, however, intent does not serve any useful role in arguments about predation. What is "intent to predate"? All firms want to maximize profits in the long

³⁷ If the probability of detection and conviction is one, the optimal penalty is approximately equal to the wealth transferred from victim to offender plus the welfare loss created by the offense. See R. POSNER, *ECONOMIC ANALYSIS OF LAW* § 7.2 (2d ed. 1977); Becker, *Crime and Punishment: An Economic Approach*, 76 J. POL. ECON. 169 (1968). I develop this point more fully in Part II *infra*.

³⁸ Cf. *Arizona v. Maricopa County Medical Soc'y*, [1980-1] Trade Cas. 78,152 (9th Cir. 1980) (holding that an agreement to set maximum prices is not unlawful per se), *cert. granted*, 49 U.S.L.W. 3663 (U.S. Mar. 9, 1981) (No. 80-419).

³⁹ See R. POSNER, *supra* note 1, at 189-91.

run, to increase their sales, and to be monopolists if that can be accomplished profitably. A standard based on intent therefore could sweep up everything or nothing. If two firms have identical costs and prices, the fact that one intends to exclude an equally or more efficient rival and the other does not tells us little of interest; either the firm's strategy reduces welfare and yields a profit to the firm or it does not. Liability should not depend on the subjective beliefs of the management. A test based on intent, with huge awards turning on the inferences to be drawn from loose language in internal corporate memoranda, is the very "cops and robbers" game that Posner has properly condemned in other contexts.⁴⁰

I therefore agree with Oliver Williamson that any approach to predation emphasizing below-cost pricing as a device to drive out rivals is unproductive.⁴¹ No theory of predation should be taken seriously unless it gives a plausible account of why the legal machinery should be invoked, and the approaches based on short-run price theory do not and cannot supply such an account.

⁴⁰ *Id.* at 47-77. The Supreme Court has concluded that intent is an element of criminal but not civil antitrust liability. *United States v. United States Gypsum Co.*, 438 U.S. 422, 436 & n.13 (1978). The "intent" to which the Court referred, however, is intent to bring about anticompetitive consequences. The Court introduced the requirement to separate accidentally anticompetitive effects of intentional conduct from the intended anticompetitive effects of intentional conduct. *Id.* at 441. The Court envisions an inquiry into intent as a way to determine whether firms engaged in a practice at least in part because of particular anticipated anticompetitive consequences. This use of intent is unhelpful in a predation case. Any sales below marginal or average cost are made because the seller anticipates that this will help drive other firms from the market. Sometimes exit is desirable, as when there is excess capacity or firms have not yet realized the full economies of scale. See *Pacific Eng'r & Prod. Co. v. Kerr-McGee Corp.*, 551 F.2d 790 (10th Cir.), *cert. denied*, 434 U.S. 879 (1977). Knowledge of the firms' "intent" will not help to determine whether their rivals' exit is desirable. See Williamson, *Predatory Pricing*, *supra* note 1, at 287-88 & n.16.

Joskow and Klevorick offer still another use for intent. They would search for "carefully constructed long-run plans to maintain monopoly power by reducing the number of firms in the market and making the entry of new firms more difficult." Joskow & Klevorick, *supra* note 1, at 259. But a search for these plans might consume years of discovery, and for what purpose? A plan to exclude competition by less efficient rivals is not anticompetitive, and a plan to exclude competition by more efficient rivals is doomed to failure. A plan to reduce production costs could be seen as a plan to make entry difficult. Moreover, because firms with planning departments usually consider the effect on their rivals of decisions about price, output, and product characteristics, it might well turn out that every large firm has a "plan" that resourceful plaintiffs can characterize as showing an intent to predate. See Spence, *Competition, Entry and Antitrust*, in *STRATEGIC PREDATION AND ANTITRUST ANALYSIS*, *supra* note 1. The search for such a plan is therefore not worth the effort, because the result is likely to mislead much more often than it illuminates.

⁴¹ Williamson, *Predatory Pricing II*, *supra* note 1, at 1184-86.

C. Signalling From One Market to Another

It is cheaper to bluff than to predate. If a firm had a reputation for cutthroat competition, it might be able to persuade rivals to stay out of its markets or to cease competing in them. If the reputation and the implicit threat of predation were credible, the "predator" could achieve all of the benefits of predation with none of the costs.

Predation, in this view, is a cousin of the government's threat to imprison bank robbers. Imprisonment does not produce any benefits for the government, and it is costly to carry out, but it may well deter potential robbers. This occurs to the extent that the government's threat is credible. If deterrence works, there are so few bank robberies that the government only rarely has to carry out its threat, and society gains, through fewer robberies, more than the cost of imprisonment. Is a dominant firm's threat to cut prices credible or effective in the same way as the government's threat to imprison bank robbers?⁴²

The threat appears to be useful when the dominant firm operates in many markets and the potential victim operates in only one of them. Then the dominant firm can cut prices in one market, inflict a serious (but not necessarily fatal) loss on its rivals there, and thus send a signal to observers in other markets and potential entrants in the first market. This signal presumably would drive out some existing rivals or deter potential entrants because they would fear becoming the target of these tactics. If the predator has a monopoly in ten markets, its gain from reducing its competition in nine markets may be much larger than its loss from the predatory campaign in one. Posner characterizes predation by a multimarket firm as a "plausible policy for a profit-maximizing seller to follow"⁴³ and suggests that it could explain the behavior of Standard Oil and other diversified, deep-pocket enterprises. Moreover, once the firm establishes a reputation for predation, it need not repeat the demonstration very often.⁴⁴ Indeed, repetition

⁴² Gary Becker first suggested that predatory pricing and imprisonment were based on the same principles. He conjectured that predation could be used to enforce illegal agreements for which ordinary contractual remedies are unavailable. Becker, *supra* note 37, at 205-07.

⁴³ Posner, *supra* note 1, at 939-40; cf. 3 P. AREEDA & D. TURNER, *supra* note 1, ¶ 711b, at 151 n.5 (a large firm may "sell at a loss" in order to discipline smaller rivals for undercutting its price); 5 *id.* ¶ 1137 (same).

⁴⁴ See F. SCHERER, *INDUSTRIAL MARKET STRUCTURE AND ECONOMIC PERFORMANCE* 338-39 (2d ed. 1980). Richard Posner and I made the same argument in R. POSNER & F. EASTER-

would be unprofitable; the genius of the strategy is that the "predator" does not need to cut price more than once. This could explain why we rarely observe actual predation.

The argument for predation by sending signals across markets is not preposterous, but it is not compelling either. Consider again the government's threat to imprison bank robbers. The government has access to inexpensive, even compulsory, financing; it obtains capital for much less than a private predator. It can pick and choose the occasions for making good on its threat, setting the penalty high enough to achieve deterrence even though only a fraction of all robbers go to prison. A monopolist, on the other hand, cannot choose when to act in this fashion. It must respond each time a firm ignores its threat, for once a rival begins to compete in a market the monopoly profits vanish.

The government is interested in the welfare of society, so it does not mind that banks and their customers capture most of the benefits from the infliction of penalties on robbers. Unless a predator is a monopolist, however, some of the gains obtainable from the infliction of "discipline" on rivals will be captured by other firms that sell in the predator's markets. If, say, the predator has 60% of gizmo sales in each of ten cities, and its predatory reputation persuades some firm not to enter these markets, then 40% of the (small) gains will be captured by the smaller firms already in these markets.⁴⁵ Predation is a marginal proposition at best. It is even less feasible when the predator incurs all of the costs and reaps only part of the gains.

Finally, the government has long recognized that its threat of

BROOK, *supra* note 1, at 683. For the reasons discussed in the text, I now think the proposition incorrect.

⁴⁵ I assume that the predator receives *some* monopoly gains. This is a generous assumption. The usual account of monopoly gains by large firms rests on the theory of oligopolistic interdependence, which is logically flawed and empirically unsupported. See R. BORK, *supra* note 1, at 101-04, 178; R. POSNER & F. EASTERBROOK, *supra* note 1, at 331-36, 913-21; Peltzman, *The Gains and Losses from Industrial Concentration*, 20 J.L. & ECON. 229 (1977). But see Weiss, *The Structure-Conduct-Performance Paradigm and Antitrust*, 127 U. PA. L. REV. 1104, 1106 (1979) ("46 studies . . . yielded significant positive relationships between concentration and profits"). The extent to which any firm can earn supracompetitive profits depends on the elasticity of market demand and supply. With any reasonable assumptions about the elasticity, the market power of a dominant firm is significantly less than that of a monopolist. R. POSNER & F. EASTERBROOK, *supra* note 1, at 347-54; Landes & Posner, *Market Power in Antitrust Cases*, 94 HARV. L. REV. 937 (1981). To the extent that nondominant firms in a concentrated industry are able to obtain significant monopoly profits, the probable explanation is a cartel (tacit or express), which should be addressed by standard cartel rules rather than by a doctrine condemning predation.

imprisonment can be negated by widespread civil disobedience. If ten percent of the population were to rob banks tomorrow, the system of sanctions would collapse. The same thing may happen to a predator. The threat to inflict losses on rivals is profitable only if it is credible yet unexecuted. If the monopolist must carry out the threat, it loses money. (I assume here, for the reasons discussed already, that predation in a single market is unprofitable.) If a firm has a monopoly in ten markets, it might be able to profit if it predated in one or two to signal the rest, but manifestly it cannot obtain the advantages of signalling if it must predate in each market. The monopolist must be able to convince rivals that it will inflict a loss on itself by predating, and it is hard to make rivals believe that this will happen.

Suppose *A* has monopolies in ten markets, that *B* is a potential rival, that *A* can make a monopoly profit of \$10 in each monopoly market over the life of the monopoly, and that it can predate (killing a rival) in any one market at a loss of \$60. In order to show willingness to predate, *A* dramatically cuts prices in one market, losing the \$60. Has *A* now ensured its monopoly in all ten markets? Hardly: *B* can enter any one of the markets, knowing that if *A* cuts price again, *A*'s entire strategy is unprofitable—it would incur \$120 in predation costs to preserve \$100 of monopoly profits. *B* will reason that *A*'s threat to predate a second time is mere bluff.

The case is not quite so easy, however. *A* will treat the \$60 already spent predating as a sunk cost. Now *A* will lose its monopoly in one market (and perhaps in all ten, if others follow *B*'s lead) unless it predates again when *B* enters. *A* therefore will respond to *B*'s entry with a price cut, even though this means that *A* has spent \$120 to protect profits of \$100. *B*, knowing that *A* will reason this way, might find *A*'s threat credible and therefore would not enter. If so, *A* would end up spending only \$60 after all.

Entry by *B* in one market thus might not be profitable, but *B* has counterstrategies available. Suppose *B* threatened to enter a market and approached *A* with a deal: If *A* will simply pay over \$59, *B* will not enter. *A*'s whole strategy depends on its commitment to predate (and lose \$60) if *B* actually enters. As was just pointed out, it is rational for *A* to lose the \$60. Paying out the \$59 appears to be a savings for *A* when compared to the \$60 it will lose if *B* enters the market, although it is a loss compared to what *A* anticipated (that *B* would be deterred). *A* thus will pay the \$59 if

B's threat is credible.⁴⁶

B's threat would be credible if *B* had made a binding commitment to enter if *A* did not pay. If *B* cannot bind itself absolutely, *A* will evaluate the credibility of *B*'s threat in other ways. For example, *A* will want to know how much *B* would lose on entry; if *B* would lose less than *A* during a price war, *A* probably would find *B*'s threat credible. *A* is now in the uncomfortable position of paying \$59 if *B* does not enter and \$60 if it does. Worse, *A* will know, before it sends the initial predatory signal, that after it has sunk \$60 there will be a *B* (and possibly others) waiting to extort a payment. The predatory strategy therefore is unprofitable even for a ten-market monopolist.

A might reason: I cannot pay *B*'s demand, because if I do there will be a *C* making the same demand, and *C*'s threat is as credible as *B*'s. Therefore, in order to avoid extortion by every firm with entry capability, I must refuse to pay *B*. If *B* is certain that I will never pay, *B* will not enter, even though *B* would lose less money than I would, because all *B* considers is profit versus loss. *B*'s strategy is unprofitable, and therefore *B* will not carry through.

B may recognize that *A* will reason this way and formulate the threat accordingly. For instance, it might bind itself to enter if *A* bound itself never to pay. Each firm can go through several levels of bluff and counterbluff, and strong threats are available to each. Because this game is played by *n* firms, each capable of making similar threats, it is unlikely that any one of these strategies dominates all others. The solution is indeterminate; *A* thus does not know whether it can profit from the predatory threat.⁴⁷

But we need not attempt to solve the whole game at once in order to see a fundamental problem with *A*'s threat. The threat unravels. If, for some reason, entrants set up shop in nine markets, *A* will not predate in the tenth. *A* has no additional markets to protect. Thus *B* always would enter the tenth market, no matter

⁴⁶ The victim of extortion need not pay cash, which might be easily detected by shareholders and antitrust officials. It could pay indirectly, by selling assets to the extorter for less than their market price or by taking a patent license for more than its value.

⁴⁷ Schelling suggests that strategic games of this sort are soluble in cases involving two players, and that the incumbent (*A*) wins, because it can move last, and *B* wants to avoid the risk of an irrational response. T. SCHELLING, *THE STRATEGY OF CONFLICT* (1960). But as Telser shows, introducing a third player removes the advantage. There is not often a solution to an *n*-player game of the sort described in the text. L. TELSER, *COMPETITION, COLLUSION, AND GAME THEORY* 175-217 (1972). See also Telser, *A Theory of Self-enforcing Agreements*, 53 J. Bus. 27 (1980).

what *A* did in the ninth. Once *A* recognizes that *B* always would enter the tenth market, however, it has no reason to spend even \$10.01 to protect its monopoly in the ninth market; the expenditure cannot prevent entry in either the ninth or the tenth market. Thus *A* would not predate in the ninth market either. The process can be extended to show that *A* would not predate at all.⁴⁸

I have assumed so far that *A* and *B* have perfect knowledge of each others' costs and strategies. The solution to the game becomes even more murky, however, if it is impossible for either player to determine whether a new entrant's losses in any given market are a result of predation or of having higher costs than the incumbent firm. If the entrant is sure that any losses have been caused by predation, it can simply remain in the market, or even expand, confident that the predation will end sooner or later. If, on the other hand, the entrant suspects that its costs are higher than those of the incumbent, the entrant may withdraw, even though predation actually accounts for the entrant's losses. Here, it seems, imperfect information leads to the predator's success.⁴⁹ But the predator faces a similar problem of calculation. It does not know the entrant's costs with certainty, and therefore it cannot tell how expensive a predatory campaign will be or what the chances of success are. Given this uncertainty, the would-be predator may elect not to fight. The potential entrant also is unlikely to have a precise knowledge of the costs of the predation to the predator or the size of its monopoly profits. If each firm is uncertain of the other's costs, neither has a clearly superior strategy.

The predator's principal risk, given imperfect information, is not *B*'s isolated response in one market. *B*'s best threats involve behavior coordinated across markets or among rivals. Suppose *B* threatened to enter two or more markets. (It need not do so simultaneously; it is enough for *B* to convince *A* that it will do so eventually.) Then *A*'s threat would cost \$120 to execute; that is a clear loss for *A*, so *A* would surrender its monopoly in these two markets. Eventually, of course, *A* would surrender in all ten markets. The process would be the same whether *A*'s threat cost \$60 or only \$11 to execute in each market. The threat of predation, far from

⁴⁸ This point is made in R. Masson & R. Roberts, *Predation: The "Noisy" Pricing Strategy* (Oct. 1980) (paper presented at the National Bureau of Economic Research Conference on Information and Statistical Behavior in Economics) (on file with *The University of Chicago Law Review*).

⁴⁹ See *id.*

preventing entry, simply increases its scale. Threatened predation is, in this respect, just like extensive vertical integration or significant economies of scale in an industry.⁵⁰ If all incumbents are integrated, a newcomer must enter several stages of production at once. If there are significant economies of scale, an entrant would need to build a relatively larger plant. The need to enter on a larger scale in response to threatened predation may retard *B*'s entry, but it does not block entry.

Creditors should be willing to lend to the entrant, for there are substantial profits to be had in the monopolized markets. Customers also should be willing to support *B*'s entry into new markets. *A*'s customers in a given market are paying monopoly prices. They know that they will continue to do so unless a new firm enters. They should therefore be willing to support *B*'s entry, perhaps by signing long-term contracts. More important, customers in *A*'s other monopoly markets also should be willing to support *B*'s entry. They know that if *B* can enter any one of the markets, *A*'s threat to predate becomes incredible in every market, and all the monopolies collapse. There are of course free-rider problems here; why should customer *X* help *B* if it could get the benefits of *B*'s entry for nothing? The contracts must be contingent on *B*'s attracting enough business to end the predation and give an equal advantage to all customers. This may be easier if some customers purchase across markets. If *A* has a monopoly in ten cities, it may confront the same group of warehousemen and retailers in each. This would allow the use of long-term contracts contingent on attracting sufficient business to solve the free-rider problem.⁵¹

Suppose that for some reason *B* cannot enter more than one market. This does not cede the ten monopolies to *A*. That *B* is too small does not give *A* much comfort. *A* also must contest with giants such as Exxon and Procter & Gamble that have shown a will-

⁵⁰ See R. POSNER & F. EASTERBROOK, *supra* note 1, at 869-76; O. WILLIAMSON, MARKETS AND HIERARCHIES 82-131 (1975). Compare R. POSNER, *supra* note 1, at 196-201 with F. SCHERER, *supra* note 44, at 300-06. See von Weizsäcker, *supra* note 20, at 401-06, for an argument that if economies of scale exist, barriers to entry will help to avoid excessive entry.

⁵¹ See text and note at note 19 *supra*. It is thus easier for *B* to enter a new market if the predator's 10 monopolies are closely related than if they are distinct. This refutes Scherer's suggestion that "[f]or predation to have a deterrent effect in such [multimarket] instances, it is important that conditions in the multiple markets served by the conglomerates be sufficiently similar" F. SCHERER, *supra* note 44, at 338. Scherer posits that the demonstration effect will be greatest when firm *A* has a dominant position in different geographic markets for the same product. *Id.* at 338-40. But it is exactly here that customers from other markets will be most likely to facilitate *B*'s entry.

ingness to enter markets in which there is a substantial profit to be made. That *B* and hundreds of other firms are too small to enter many markets tells us nothing of interest, unless every firm is too small. The argument here, in other words, is just like the argument about the potential competition doctrine. A merger that eliminates one potential competitor, like *B*'s inability to enter more than one market, is of no antitrust interest unless there are substantial barriers to entry, the eliminated firm was able to overcome the barriers, and the remaining firms in the economy are not.⁵² That will rarely, if ever, be the case.

Even if no single firm can enter more than one of *A*'s markets, *B* can attempt to organize other entrants. *B*, *C*, *D*, and *E* know that if they enter one market apiece, *A* cannot profitably predate. The firms therefore can organize and coordinate their entries, and *A* has no satisfactory response. True, this cooperation could be viewed as involving territorial or customer allocations, especially if *A*'s monopolies are in different geographic markets for the same product, but it would be singularly perverse to condemn as unlawful an agreement that serves to shatter a number of monopolies simultaneously.

Many of the counterstrategies available to a predator's rivals involve significant costs. It is not cheap to coordinate entry across several markets or among several entrants. In some cases the costs could be so high that the predator's threat would carry the day. Nonetheless, the predator could not be confident of this, and an elaborate series of bluffs and counterthreats is available to all parties. One conclusion is unavoidable: it has not been proved that predatory signalling is a profitable strategy. If, as I have suggested above, the proponent of invoking the legal system to remedy prices that are "too low" has a heavy burden,⁵³ then the inconclusive arguments about signalling are inadequate to justify legal intervention.

⁵² 5 P. AREEDA & D. TURNER, *supra* note 1, ¶¶ 1116-1126; Comment, *Toehold Acquisitions and the Potential Competition Doctrine*, 39 U. CHI. L. REV. 156 (1972). But see O. WILLIAMSON, *supra* note 50, at 165-70. The courts recently have shown considerable reluctance to hold a merger unlawful solely because it eliminates one potential competitor among many. *United States v. Marine Bancorp.*, 418 U.S. 602 (1974); *United States v. Siemens Corp.*, 621 F.2d 499, 506-10 (2d Cir. 1980); *BOC Int'l Ltd. v. FTC*, 557 F.2d 24 (2d Cir. 1977); *FTC v. Atlantic Richfield Co.*, 549 F.2d 289 (4th Cir. 1977).

⁵³ See text at note 13 *supra*.

D. Strategic Commitments

Strategies involving sporadic low prices or signals about low prices are likely to be unprofitable, but it does not follow that a *binding* commitment to predate would be unprofitable. If any isolated episode of predation would be unprofitable, the interest of the would-be predator lies in capitulating when its bluff is called. But if the predator can alter its characteristics so that it becomes rational for it to predate in the event of entry, then perhaps its threat would be credible and consequently effective. The problem lies in designing an effecting commitment.

One conceivable entry-detering investment is an unduly large plant. Michael Spence has developed a detailed model of entry-detering capacity selection.⁵⁴ In his model, the monopolist chooses a capacity so large that a new entrant could make no sales at a profitable price if the incumbent used all of its capacity. Although carrying the excess capacity is wasteful, the incumbent finds it advantageous if the investment does not use all of the monopoly profit. It is left with some monopoly profit after building the plant, whereas its profit would have declined to zero had it built a smaller plant that allowed entry. Consequently, according to Spence, the monopolist will preserve its position and, in the process, turn most of the monopoly profit into socially wasteful costs.⁵⁵ Other economists have built similar models concerning product selection, patenting, and advertising.⁵⁶

Spence's approach resembles the argument Judge Learned Hand made in the *Alcoa* case.⁵⁷ The government argued that Alcoa had monopolized the aluminum market by, among other things,

⁵⁴ Spence, *Entry, Capacity, Investment and Oligopolistic Pricing*, 8 BELL J. ECON. 534 (1977). See also Spence, *Investment Strategy and Growth in a New Market*, 10 BELL J. ECON. 1 (1979). Spence has never asserted that his theoretical models have antitrust significance, but other authors have relied on them, see, e.g., Schmalensee, *On the Use of Economic Models in Antitrust: The ReaLemon Case*, 127 U. PA. L. REV. 994 (1979); Williamson, *Predatory Pricing*, *supra* note 1, at 293 n.31. See also Eaton & Lipsey, *Exit Barriers Are Entry Barriers: The Durability of Capital as a Barrier to Entry*, 11 BELL J. ECON. 721, 728 (1980) (using a Spence-type model but conceding that "[a]pplication to policy is clearly premature").

⁵⁵ See Posner, *The Social Costs of Monopoly and Regulation*, 83 J. POL. ECON. 807 (1975).

⁵⁶ See, e.g., Gilbert, *Patents, Sleeping Patents and Entry Deterrence*, in STRATEGIC PREDATION AND ANTITRUST ANALYSIS, *supra* note 1; Salop, *supra* note 20; Schmalensee, *Entry Deterrence in the Ready-to-Eat Breakfast Cereal Industry*, 9 BELL J. ECON. 305 (1978); Schmalensee, *supra* note 54.

⁵⁷ *United States v. Aluminum Co. of Am.*, 148 F.2d 416 (2d Cir. 1945).

building new plants in anticipation of growth in demand. The court concluded that this expansion of capacity by a monopolist violated the Sherman Act, explaining that "we can think of no more effective exclusion than progressively to embrace each new opportunity as it opened."⁵⁸ Judge Hand's opinion has been subjected to a withering critique. Areeda and Turner, among many others, argued that Judge Hand had condemned Alcoa for behaving like a competitor rather than a monopolist. A profit-maximizing monopolist, they pointed out, would have curtailed output. Alcoa instead built new plants, showing that it was not exploiting its position, and it was thus "absurd" for Judge Hand to call the behavior exclusionary.⁵⁹ Spence's argument, if correct, rehabilitates Judge Hand's opinion.⁶⁰

But there is a substantial problem with any theory of predation built on changes in capacity or other nonprice attributes of production. As Spence himself has pointed out, it is impossible in practice to tell which capacity decisions are predatory (that is, raise average cost of production and are profitable only because they exclude lower-cost firms) and which are efficient.⁶¹ If demand is growing, some firm must expand; in addition, a rational competitive firm will want to build so that capacity is ready to meet the demand, or will want some "excess" capacity to guard against the risk of equipment malfunction. The largest increases in capacity may be the most desirable, because they may be associated with large increases in demand or new, cost-saving technologies.⁶² Any attempt to condemn capacity selection decisions as predatory carries with it an unavoidable risk of deterring firms from selecting the most desirable response to change. No one could possibly state with any degree of certainty that a given plant under construction should not be built because the only motive for building it is predatory. And it will not do to allow a firm to build a new plant and then have the legal system evaluate whether it is used "ade-

⁵⁸ *Id.* at 431.

⁵⁹ 3 P. AREEDA & D. TURNER, *supra* note 1, ¶ 608d.

⁶⁰ The FTC recently rejected the premises of *Alcoa*. See E.I. du Pont de Nemours & Co., 987 ANTITRUST & TRADE REG. REP. (BNA) F-1 (F.T.C. Oct. 30, 1980) (holding that a firm may substantially increase its capacity, and even become a monopolist, if it does so without overt exclusionary practices). See also *Berkey Photo, Inc. v. Eastman Kodak Co.*, 603 F.2d 263, 272-75, 285-87 (2d Cir. 1979) (discarding *Alcoa*'s conclusion that growth by a monopolist is unlawful), *cert. denied*, 444 U.S. 1093 (1980).

⁶¹ Spence, *supra* note 40. See also 3 P. AREEDA & D. TURNER, *supra* note 1, ¶ 718b.

⁶² See E.I. du Pont de Nemours & Co., 987 ANTITRUST & TRADE REG. REP. (BNA) F-1 (F.T.C. Oct. 30, 1980), in which du Pont pioneered a large-scale but cost-saving technology.

quately" five years later, on the assumption that unused capacity is a sign of predatory investment. The decision to build is based on projections subject to substantial uncertainty. Condemning an expansion when assumptions prove erroneous or market conditions change would make any such investment much more risky, and thus deter beneficial expansion as well.

There also are basic flaws in all of the entry deterrence theories. I examine here the capacity selection theory. There are two ways in which capacity selection may exclude competition by equally or more efficient firms. First, the firm with large capacity may obtain advantages just because it is first; I postpone for the moment discussion of this "first-mover advantage." Second, the firm may choose an unusual design for its large plant. The plant may have high fixed costs and very low marginal costs; it is "inefficient" in the sense that the average total cost of production is larger than it would be if the plant had been designed without exclusion of competitors in mind. If a competitor enters with an ordinary (and more efficient) plant, having lower fixed costs but higher marginal costs than the predator, the predator simply expands output and forces the entrant to operate at a loss. A potential entrant, understanding the predator's ability to impose this loss, will stay out of the market.

This strategy works, if it works at all, only for established firms. It depends on the assumption that the predator's plant costs are "sunk," while the entrant's are yet to be incurred. Only that combination allows the predator to ignore its fixed costs and make production decisions based on marginal cost alone, for only then is it as cheap to produce at the point where marginal cost equals price as it is not to produce at all. A predator could not plan to drive out an established rival by building a big plant with the ability to produce at low marginal cost, for then the rival's costs are sunk and the predator's higher costs are yet to be incurred. The predator must then make its production decisions on the basis of total costs, while its rival can turn the tables and look only to its marginal cost. This restriction on the scope of the theory obviates concern about many potential predatory strategies. And it is a substantial restriction—it means not only that an upstart firm cannot predate against an established rival, but also that a predator cannot hold its monopoly if demand is growing. Each increment of demand can be seen as a new "market," for which the established firm must compete on the same basis as the rival. It means, too, that the monopoly cannot last longer than some fraction of the

useful life of the predator's first plant. Once it comes time to rebuild, the predator and the potential entrant stand on the same footing, and whichever firm builds the plant with the lower average total cost will claim the market.⁶³

Even as practiced by an established firm, however, the high-fixed-cost, low-marginal-cost plant strategy is of doubtful utility. There may not be any available technology that reduces marginal cost to the extent that no rival can enter. The driving force of the strategy is the supposed ability of the predator to convert itself into a natural monopolist by altering its cost functions. If no natural monopoly structure is available with current technology, no one need worry about this sort of predatory threat. If the monopolist merely builds a large plant, *without* ensuring ability to produce at a long-run marginal cost less than that of any possible rival, then the rival will enter the market and undersell the former monopolist. The predator could not exclude this rival without committing suicide, and it would have no reason to do so when both firms could survive at higher prices.⁶⁴

Even if the predator is able to build a large plant that, despite producing at a high average cost, can operate at low marginal cost, it does not follow that the strategy will exclude rivals. The rival may call the predator's bluff and enter; once it has done so, the former monopolist may conclude that its welfare is maximized by taking the rival's output as given and acting as a monopolist over the residual demand. That the predator *can* sell at less cost than the rival does not mean that it will do so; in most models of duopoly neither firm sells at marginal cost.⁶⁵ The rival therefore need not accept the predator's ability to sell at a low price as a binding commitment to do so. Entry may still be profitable; if that is so, then there was no point in the predator's construction of the ineffi-

⁶³ See von Weizsäcker, *supra* note 20, at 405-06, for a formal demonstration of these points. Indeed, the incumbent's strategy may unravel in the same way as a signalling strategy, *see* text and notes at notes 42-53 *supra*, because in the last period before the incumbent's plant wears out it loses any "predatory" capacity; the last period can be advanced by any rival that chooses to build a larger, longer-lived plant. *See* Eaton & Lipsey, *supra* note 54, at 722.

⁶⁴ Dixit, *The Role of Investment in Entry Deterrence*, 90 *Econ. J.* 95 (1980); Stigler, *The Dominant Firm and the Inverted Umbrella*, 8 *J.L. & Econ.* 167, 171 (1965). Spence also concedes that an entrant could build a plant in such a way as to compel the first firm to choose a smaller capacity or not to use all of the capacity it has. *See* Spence, *Investment Strategy*, *supra* note 54, at 9, 12-14.

⁶⁵ J. HIRSHLEIFER, *PRICE THEORY AND APPLICATIONS* 396-402 (2d ed. 1980); Dixit, *supra* note 64.

cient capacity in the first place. This leads us inexorably back toward the bluff and counterbluff pattern discussed earlier. For the same reasons advanced in that section, there is no clearly dominant strategy here.

Another problem with the theory is that entrants can solicit long-term contracts to ensure that the low-marginal-cost predator does not use any excess capacity it may have. The predator's customers are paying a monopoly price. The entrant can offer the customers a better deal: a long-term contract at the entrant's marginal cost, which, on the assumptions of Spence's model, is the competitive price and thus is less than the inefficient predator's monopoly price. Once the entrant has signed long-term contracts for the entire output of an efficiently sized plant, it is invulnerable to price cuts by the predator. The predator's only rational response is to cut back production and monopolize the remaining demand. The process can be repeated by other entrants until the predator sells only the output of one efficiently sized plant, which it would sell at the competitive price (its rivals' marginal cost). A potential predator, understanding this process, would not build the large, inefficient plant.

The predator's alternative is to undersell the rival on long-term contracts. Because the predator can produce at a lower marginal (albeit higher average) cost than its rival, the predator always could beat the rival's offer on long-term contracts. This would indeed exclude competition, but only because the predator was binding itself to charge less than the competitive price for a long period. Such a process is not attractive to a monopolist, however attractive it may seem to consumers.

If the predator can undersell the entrant with long-term contracts, however, why would the entrant bother to offer such contracts? For one thing, the cost of selling contracts is low. They could be written to take effect only after the entrant had obtained enough customers to build an efficient plant, ensuring no losses to the entrant as a result of its contractual obligations; the attempt would be worthwhile to the entrant because the predator might well respond by monopolizing the remaining customers rather than by selling at the entrant's price. (Although this would lead to the eventual loss of the predator's monopoly, it also maximizes profit in the short run.) Moreover, an entrant beginning to sign long-term contracts is in a powerful bargaining position; it could inflict substantial losses on the incumbent by carrying out the threat to enter. As a result, the incumbent would be willing to offer side

payments (bribes) to induce the rival to stop. The prospect of receiving these payments could be enough to put the contracting process in motion and thus undercut the predator's profits. Of course, a system of payments ultimately would attract a swarm of incipient rivals, lining up to be paid, undercutting those profits further. The more "binding" the predator's commitment to expand output in the event of entry, the greater the rival's incentive to offer long-term contracts to the predator's customers. The entrant either will obtain a profitable business while the predator loses money or will be paid by the predator to stay away.

What, then, of the "first-mover advantages" available to the first firm that enters a market with a large capacity? Oliver Williamson argues that the new entrant's start-up costs will themselves be sufficient to exclude entry, even if the incumbent and the entrant have access to the same technology.⁶⁶ Incumbent firms have already invested their start-up costs, which are therefore treated as sunk. Because the entrant must recover its start-up costs, the incumbent has an advantage; if it increases output in the event of entry, it may be able to cover its marginal costs but prevent the entrant from recovering its start-up costs. Moreover, assuming that incumbent and prospective entrants each can produce at the same costs, and that per-unit costs decline over some range before becoming constant, then the incumbent can also arrange to operate in the least-cost area of production, and to produce enough to consign the entrant to selling at a higher per-unit cost. The entrant will realize that it cannot sell enough units to reach the lower-cost portion of its average cost curve, and hence will stay out of the market. Consequently, Williamson argues that the incumbent should not be allowed to increase output following entry.

This theory is a very weak explanation of the behavior usually challenged as "predatory." By its own terms, it applies only to monopolized markets. Once two firms are producing in the market, both have sunk their start-up costs; both have plants, outlets, knowhow, customer lists, and so on. Williamson's approach does not explain why one of these firms does not grow rapidly if the other attempts to charge a supracompetitive price. Yet almost all cases of asserted "predation" involve markets in which two or more firms are competing.

The theory also contains several implausible assumptions. In

⁶⁶ Williamson, *Predatory Pricing*, *supra* note 1, at 295 & n.36.

Williamson's and similar models, prospective entrants do not act as strategic profit maximizers. Only the established firms behave strategically. Entrants follow a rigid decision rule of some sort. Williamson's prospective entrants all assume that the incumbent can and will carry out a threat to increase output,⁶⁷ and that the incumbent will sell all of its increased output.⁶⁸ The entrant then will produce just enough to fill the residual demand. If the entrant, faced with start-up costs and production on the higher-cost portion of the average cost curve, cannot recover its cost at this output, it stays out.

Entrants would never follow a decision rule of this sort. They need not be content to fill the residual demand. They have the option of coming in at the most efficient scale and selling first by shaving price, leaving the incumbent with the unhappy choice of yielding the monopoly or committing suicide by producing more units at ever-increasing marginal cost while the increased production drives price downward. The incumbent's threat to expand output in the face of such an entry would be incredible unless, as in Spence's approach, the incumbent has lower marginal costs than the entrant.

Another flaw in Williamson's analysis is revealed by consideration of the unusual cost curves that his firms are assumed to have. If long-run average total cost decreases over the early units of output and then becomes flat, as it does in his model, the industry is a natural monopoly. The total output could be produced at least cost by a single firm, because only one firm would incur the start-up costs and initial high-cost units of output. If marginal cost begins to rise at some point, then there would not be a natural monopoly, but the incumbent firm also would be unable to deter entry profitably. At some point on the dominant firm's rising cost schedule, it will become more costly for the firm to produce a marginal unit than for the entrant to do so, even given the entrant's start-up costs. In other words, if the incumbent's average total costs are flat in the relevant region of the curve there is no reason to mourn the lack of entry, and if the incumbent's costs are rising it will not be able to prevent entry.

There is almost no empirical support for Williamson's first-mover approach. We almost always see two or more firms compet-

⁶⁷ Williamson explicitly assumes that incumbents always produce as much as the governing rule permits. *Id.* at 294.

⁶⁸ *Id.*

ing in a given market. We also have some evidence of what happens when patents, which create lawful monopolies (and perforce first movers), expire. The monopolist's market share usually declines precipitously; if the share does not, the price does.⁶⁹ The firm cannot enjoy both a monopoly price and a perpetual monopoly market share. Dominant firms created by merger also lose market share in later years.⁷⁰ Firms that create wholly new, but unpatented, products find that they cannot maintain their monopolies. For example, after Kodak introduced the Instamatic cameras, rivals soon copied the devices and began to sell them at lower prices. Kodak's share of camera sales is now lower than it was before it introduced the 126 and 110 Instamatic systems.⁷¹ The entrants, far from being excluded by "first-mover advantages," simply took a free ride on some of Kodak's research and development, entering with costs lower than Kodak's.⁷²

Finally, Williamson's antidote may be worse than the poison. Williamson himself argues that a firm confronted with his no-postentry-output-expansion rule would increase its planned output prior to entry, in order either to forestall entry or to secure the highest market share if entry occurs. This is the equivalent of setting a "limit price,"⁷³ which is higher than the competitive price but lower than the monopoly price. Williamson acknowledges that the limit price may extend the first entrant's monopoly, and thus the allocative loss, but he argues that this is preferable to the greater loss a monopolist would inflict by setting a full monopoly price and then attempting to expel entrants.

It is far from clear, however, that Williamson's rule would have the effect he foresees. A strong case can be made that limit

⁶⁹ For example, American Viscose had 100% of the rayon market in 1920, when its patent expired; nine-years later it had only 50%; and who today has even heard of the firm? See J. MARKHAM, *COMPETITION IN THE RAYON INDUSTRY* 46-47 (1952).

⁷⁰ American Can's initial market share of 85% in 1901 had fallen to 50% by 1914. 1 S. WHITNEY, *ANTITRUST POLICIES: AMERICAN EXPERIENCE IN TWENTY INDUSTRIES* 289 (1958). International Harvester's share was 75% on its formation in 1902 and only 45% within 20 years. J. DIRLAM, A. KAPLAN & R. LANZILLOTT, *PRICING AND BIG BUSINESS: A CASE APPROACH* (1958). U.S. Steel's share fell from 66% in 1901 to 42% in 1925. Stigler, *supra* note 64.

⁷¹ Some of the sales data are collected in *Berkey Photo, Inc. v. Eastman Kodak Co.*, 603 F.2d 263 (2d Cir. 1979), *cert. denied*, 444 U.S. 1093 (1980).

⁷² See generally Kitch, *The Law and Economics of Rights in Valuable Information*, 9 J. LEGAL STUD. 683 (1980).

⁷³ Williamson's articles draw heavily on the limit-pricing literature, see Williamson, *Predatory Pricing*, *supra* note 1, at 292 n.26, and John McGee has demonstrated the equivalence between Williamson's views and limit pricing, McGee, *supra* note 1, at 307-16.

pricing does not exclude entry under any circumstances.⁷⁴ Even if limit pricing sometimes succeeds, it will not always do so. Thus an incumbent dominant firm, faced with a ban on expanding output after entry, may well conclude that it can maximize its profits by setting a monopoly price, collecting monopoly returns for as long as possible, stoically accepting entry when it comes, and then adjusting to set a profit-maximizing price for the residual demand.⁷⁵ The longer the monopolist expects entry to take, the more it will incline toward this strategy.⁷⁶ Williamson's suggested rule would therefore induce dominant firms to engage in monopoly pricing.

E. Predation Against a Less Efficient Rival

So far, I have discussed the predatory strategies a firm could use against equally or more efficient producers. They are vulnerable to counterstrategies and often unprofitable on their own terms. It is much easier for a firm to kill a *less* efficient rival,⁷⁷ because a dominant firm need not reduce price to its marginal cost in order to demonstrate to a less efficient rival that staying in the

⁷⁴ See P. Milgrim & J. Roberts, *Equilibrium Limit Pricing Doesn't Limit Entry* (Discussion Paper 399, Northwestern University Center for Mathematical Studies in Economics & Management Science, Oct. 1979) (on file with *The University of Chicago Law Review*).

⁷⁵ This apparently is the strategy U.S. Steel selected, and it produced decades of high prices and inefficient production. Stigler, *supra* note 64. Stigler's analysis of the facts of the U.S. Steel case has been questioned, Parsons & Ray, *The United States Steel Consolidation: The Creation of Market Control*, 18 J.L. & Econ. 181 (1975), but his economic analysis of dominant firm pricing stands. See also L. Lewis & R. Reynolds, *Predatory Pricing Rules: A Fundamental Difficulty* (1980) (unpublished manuscript on file with *The University of Chicago Law Review*) (arguing that the Williamson rule would induce monopolists to switch to U.S. Steel's strategy).

⁷⁶ Pashigian, *Limit Price and the Market Share of the Leading Firm*, 16 J. INDUS. ECON. 165 (1968); cf. Easterbrook, *supra* note 1 (critique of Ordover & Willig, *supra* note 1, on the same point). See also Baumol, *supra* note 1, at 4, 5 n.13. Baumol attempts to deal with this problem in Williamson's approach by allowing a dominant firm to reduce price and expand output without limit, so long as it does not increase price again for a few years. Unfortunately, Baumol's approach would severely penalize inaccurate guesses by firms faced with unknown changes in the elasticity of demand. New entry presents difficult problems; Baumol's rule would lock firms into their first responses even if the responses were self-destructive. See Easterbrook, *supra* note 1 (on accidental predation). Firms consequently would avoid making fully competitive responses to entry, and Baumol's rule could produce the same deleterious effects as Williamson's. Moreover, there would be formidable problems in administering Baumol's approach. What does one do with inflation? With changes in the demand schedule during the period of frozen price? With entry into a natural monopoly market? Baumol's attempt to wrestle with some of these problems indicates that he would apply the model of regulated utilities to the entire economy.

⁷⁷ It is difficult to predate successfully even in those circumstances, however. See text at notes 20-25 *supra*.

market is unprofitable.

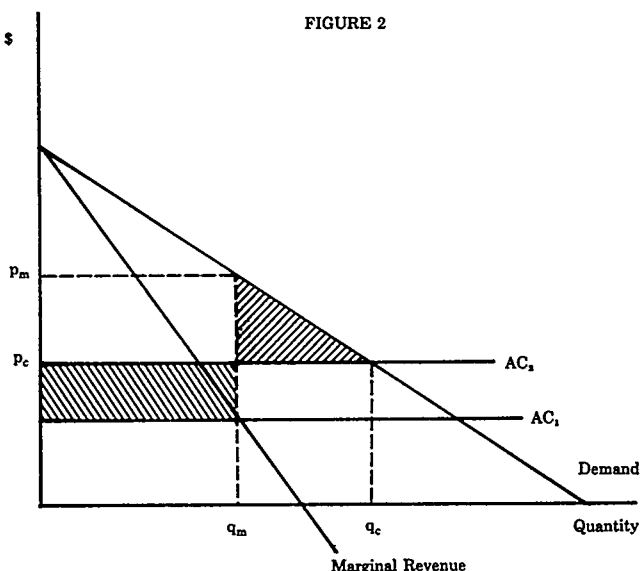
Most theories of predation express no concern for less efficient rivals. Areeda and Turner, for example, are explicit, maintaining that a monopolist should be allowed to evict a less efficient firm because it can do so by competition "on the merits." The antitrust laws, they argue, are not designed to give shelter to inefficient producers.⁷⁸ Ousting an inefficient producer always improves welfare in the short run, which in Areeda and Turner's view is all that counts.

This contention has not been universally adopted. Several scholars, and at least one court, have argued that the exit even of a less efficient producer can reduce consumers' welfare.⁷⁹ Their argument is that there are two kinds of economic efficiency: allocative efficiency and productive efficiency. A market is allocatively efficient if it allocates goods to all those who value them at more than the cost of production. It is productively efficient if the goods are made at the lowest possible average cost.

Figure 2 depicts the welfare losses from monopoly and from inefficient production. It assumes that a monopolist can manufacture the product for AC_1 , while for some reason firms in a competitive market cannot make it for less than AC_2 . The loss from monopoly consists of the inability of consumers who value the good at more than p_c , the competitive price, but at less than p_m , the monopoly price, to purchase the product. This loss is shown as the shaded triangle. The productive loss from competition is the greater cost of producing goods at AC_2 rather than AC_1 , times q_m (the quantity of goods a monopolist would produce). This loss is shown as the shaded rectangle.

⁷⁸ 3 P. AREEDA & D. TURNER, *supra* note 1, ¶¶ 715a, 717. See also R. POSNER, *supra* note 1, at 188; Posner, *supra* note 1, at 942-44; Williamson, *Predatory Pricing*, *supra* note 1, at 289-92.

⁷⁹ Hay, *supra* note 1; Scherer, *Comment*, *supra* note 1, at 883-89. See also *In re IBM Peripheral EDP Devices Antitrust Litigation* (Transamerica), 481 F. Supp. 965, 993 (N.D. Cal. 1979) (the "short-run welfare maximization argument is short-sighted. . . . Once the competitive threat has been extinguished, the monopolist will return to higher prices and profits. When that happens, society will suffer a greater welfare loss."), *appeal docketed*, No. 80-4048 (9th Cir. Jan. 31, 1980); *ILC Peripherals Leasing Corp. v. IBM*, 458 F. Supp. 423 (N.D. Cal. 1978), *aff'd per curiam sub nom. Memorex Corp. v. IBM*, 636 F.2d 1188 (9th Cir. 1980).



If society must choose between allocative inefficiency and productive inefficiency, it does so by comparing the size of the two losses. If the area of the shaded triangle is smaller than that of the shaded rectangle, we should prefer the monopoly with efficient production.⁸⁰ On the other hand, if the shaded triangle has the greater area, we should prefer inefficient production for the sake of efficient allocation. Predation against less efficient firms arguably requires society to make such an evaluation. If inefficient firms enter a monopolized market, they can induce the monopolist to cut price, thus eliminating the allocative loss, yet cause a loss of productive efficiency; if the monopolist can cut price and expel the new firms, it perpetuates the allocative loss. The argument thus concludes that antitrust law should prevent predation in those markets where driving out (or deterring entry of) less efficient firms would lead to perpetuating an allocative inefficiency greater than the productive inefficiency from tolerating the less efficient

⁸⁰ For discussions of the tradeoff between allocative efficiency and productive (or X) efficiency, see Leibenstein, *Allocative Efficiency vs. "X Efficiency,"* 56 AM. ECON. REV. 392 (1966); Stigler, *The Existence of X-efficiency,* 66 AM. ECON. REV. 213 (1976); and Leibenstein's reply, *X-efficiency Xists—Reply to an Xorcist,* 68 AM. ECON. REV. 203 (1978). See also Muris, *The Efficiency Defense Under Section 7 of the Clayton Act,* 30 CASE W. RES. L. REV. 381 (1979); Williamson, *Economies as an Antitrust Defense: The Welfare Tradeoffs,* 58 AM. ECON. REV. 18 (1968); Williamson, *Economies as an Antitrust Defense Revisited,* 125 U. PA. L. REV. 699 (1977).

rival. Moreover, it would define "predation" by relation to the entrant's, not the monopolist's, costs. It would be "predatory" for a firm to charge a price less than an entrant's average total costs in these circumstances.

The easiest way to demonstrate that their argument is not compelling is to turn it around. Suppose there are twenty firms, each with five percent of the barbed wire market. One of the firms develops a secret cost-saving process or hires a very effective manager. As a result, it is able to make barbed wire for less than its competitors. It sets a price lower than the competitors' marginal costs, but above its own costs. This may well drive the other nineteen firms out of the market, because they can no longer sell at the going price unless they, too, can reduce costs. Once the innovator acquires a monopoly it could increase price again. The process of cost reduction and growth is highly desirable: no one seriously proposes to prevent an innovator from growing at the expense of its rivals. Halting such growth would reduce or eliminate the incentive for reducing costs in the first place, because the innovator would not be able to realize the full social gains of the innovation. In addition, it is socially desirable that the low-cost process should be applied to the largest possible share of barbed wire production.⁸¹

If it is desirable for the innovator to grow, can it also be desirable to force it to tolerate less efficient rivals entering under a ban on effective competition imposed once the innovator has won a large market share? The reentry would contract the share of production that uses the cost-saving technique and would reduce the incentive to innovate. Yet the proposal to compare allocative efficiency with productive efficiency sometimes would require the newly dominant firm, having won the contest in the market, to turn around and offer a protected market to the same less efficient rivals it had just bested. Because this out-again in-again process is plainly undesirable, an advocate of comparing the two varieties of efficiency logically should insist that the cost-reducing process not be used in the first place, or at least that a firm that reduces costs not be allowed to cut price or harm its rivals in any other way. Such a position, maintained over the long run, could do great harm to the process of competition.

⁸¹ See *Berkey Photo, Inc. v. Eastman Kodak Co.*, 603 F.2d 263 (2d Cir. 1979), *cert. denied*, 444 U.S. 1093 (1980); *E.I. du Pont de Nemours & Co.*, 987 ANTITRUST & TRADE REG. REP. (BNA) F-1 (F.T.C. Oct. 30, 1980).

At all events, it is quite unlikely that allocative efficiency losses often would exceed the productive efficiency losses from tolerating inefficient entrants. Unless the monopolist charges a price exceeding marginal cost by more than 20 percent, even a trivial reduction in productive efficiency more than offsets the allocative efficiency loss of the monopoly.⁸² Even when the monopoly overcharge is substantial and the inefficient entrant is small, it usually makes sense to allow the monopoly to persist.

An example may be helpful. Assume that Octopus Industries makes barbed wire. Its marginal (and average total) cost is \$10 per roll of wire. It has a monopoly, perhaps because its especially low costs enabled it to drive rivals from the market. It sells 1,000 rolls per year at the monopoly price of \$15 per roll. Now Fringe Producers enters the market. Its marginal and average total cost is \$14 per roll for the first 100 rolls and \$15 for every additional roll. Octopus could respond to the entry in two ways. It could shave the price to \$14.9999 per roll, conceding 100 rolls to Fringe and filling the residual demand of 900-plus rolls,⁸³ or it could cut the price to \$13 per roll, selling 1,100 rolls and driving Fringe out of the market. If Octopus pursues the first strategy, it will collect a monopoly rent of \$4,500 in year one and every later year until the next entry; if it pursues the second strategy, it will collect a monopoly rent of \$3,300 in year one and \$5,000 in every later year until the next entry. The second strategy sacrifices \$1,200 in the first year in exchange for \$500 in every later year until the next entry.

Here, even though the monopoly price is 50% higher than Octopus's marginal cost, there is no allocative welfare loss from expelling Fringe. One thousand rolls are sold whether Fringe is in or out. Meanwhile, the productive inefficiency loss from replacing 100

⁸² See Williamson, *Economies Revisited*, *supra* note 80, at 709. This is so because allocative inefficiency occurs only over the range between the competitive output and the smaller monopoly output. Productive inefficiency, on the other hand, occurs over the entire output. See Figure 2 and explanation in text at note 80 *supra*. Although monopoly prices can in theory be much higher than competitive prices, they rarely are in practice (perhaps because of the danger of attracting the attention of law enforcement officials). It therefore appears unlikely that allocative inefficiency often would exceed productive inefficiency.

⁸³ The output of Octopus and Fringe together will always exceed the output of Octopus alone, because of the slight drop in price and the slight increase in elasticity of supply. Under some circumstances, it would even make sense for Octopus to expand its production. See the illuminating graph presented by McGee, *supra* note 1, at 325. In most cases, however, the new rolls from Fringe will simply replace rolls from Octopus, as the dominant firm attempts to adhere to the monopoly output for the market. I assume for the sake of simplicity that such a replacement occurs here; the analysis would not change significantly if Octopus made 920 rolls rather than 900 after Fringe's entry.

rolls of wire that could be produced by Octopus for \$10 each with Fringe's 100 rolls at \$14 each would be \$400 per year. Even if Fringe's entry caused price to decline by an appreciable amount (say, to \$14.95 per roll) and total sales to increase to 1,007 rolls, that still would not offset the reduction in productive efficiency caused by Fringe's entry.⁸⁴ The allocative loss on Fringe's exit caused by the reduction from 1,007 rolls to 1,000 rolls would be 17.5 cents,⁸⁵ substantially less than the gain of productive efficiency produced by the ouster. If Fringe had entered with the ability to make more than 100 rolls at \$14, thus increasing the potential productive inefficiency, the savings from evicting Fringe from the market would be even greater.

Moreover, there is no sufficient reason to think that courts are capable of comparing the welfare costs of monopoly with those of protecting less efficient firms.⁸⁶ It is not possible to determine either loss without knowing the elasticity of demand. Without reliable information about the elasticities, a court could not compute either the allocative efficiency loss at the monopoly price or the productive efficiency loss at the competitive price, because it could not determine either the competitive price or the number of units that would be purchased at that price.⁸⁷ Unfortunately, as the courts have recognized, it is extraordinarily difficult to measure elasticities.⁸⁸ An economist could, in theory, measure elasticities by

⁸⁴ Why 1,007 rolls? If the elasticity of demand is 2, then a price reduction of 1% will lead to a sales increase of 2%. Here the reduction from \$15.00 to \$14.95 is approximately .33%, and the increase from 1,000 to 1,007 rolls is approximately .7%, which indicates that the elasticity is close to 2. Note, however, that such a price reduction is unprofitable for Octopus. At a price of \$14.95 Octopus will sell 907 rolls, receiving a total profit of \$4,489.65 (computed from $907 \times \$14.95 = \$13,559.65$, minus costs of \$9,070.00). If Octopus held to a price of \$15.00, it would make \$4,500.00.

⁸⁵ If the demand curve is a straight line, and if the monopolist produces at constant average cost, then the allocative efficiency loss is the area of the shaded triangle in Figure 2 *supra*, or $\frac{1}{2}(\Delta Q \cdot \Delta P)$. Here $\Delta Q = 7$ and $\Delta P = 5$ cents. Note that there is an efficiency gain from driving Fringe out of the market whenever Fringe's costs exceed \$10.005 per roll for the first 100 rolls.

⁸⁶ Bork argues convincingly that courts could not compute the two kinds of losses. R. BORK, *supra* note 1, at 122-53. See also 3 P. AREEDA & D. TURNER, *supra* note 1, ¶ 715b; Joskow & Klevorick, *supra* note 1, at 234 n.50.

⁸⁷ Of course, if marginal cost is constant over the entire output, the court could determine the competitive price. But it could not determine the competitive quantity without knowing the elasticity of demand.

⁸⁸ See Landes & Posner, *Should Indirect Purchasers Have Standing to Sue Under the Antitrust Laws? An Economic Analysis of the Rule of Illinois Brick*, 46 U. CHI. L. REV. 602, 615-21 (1979). The Supreme Court has recognized this difficulty in several respects. For example, in *Illinois Brick Co. v. Illinois*, 431 U.S. 720, 741-43 (1977), it recognized the theo-

collecting a number of price-quantity pairs in the same market and drawing a curve to fit these observations. He could, for example, observe that at a price of \$15 consumers purchased 1,000 rolls of barbed wire, and that at a price of \$14.95 they purchased 1,007 rolls. He would infer from this that the elasticity of demand is 2 (meaning that a 1% reduction in price led to a 2% increase in sales). But that would be only a rough guess. Perhaps market conditions changed in the interim; the elasticity could be .5, and the change in quantity would be accounted for by an increase in market demand. Even if the economist could compute a reliable elasticity, it would apply only in the immediate vicinity of the observed price-quantity pairs. Observations of elasticity at 1,000 rolls do not tell much about elasticity at 1,500 rolls.

One more problem makes a comparison of the two efficiencies all but impossible. The appropriate comparison is not between (a) efficiency with Fringe in and (b) efficiency with Fringe out and Octopus ensconced as a monopolist. It is between (a) and (c) efficiency with some third firm in the market. Once some other firm has learned to make barbed wire as cheaply as Octopus, it can enter with impunity. The allocative loss from expelling Fringe thus must be computed over the interval between Fringe's departure and the arrival in the market of some other firm. A court could not determine when some third firm will match Octopus's costs, and thus it could not compute the amount of the allocative loss. On the other hand, the entry of another efficient producer would not drive Fringe from the market if predation were forbidden. The productive inefficiency thus would continue.

A serious proposal to compare allocative efficiency with productive efficiency thus requires courts to supervise innovation and cost reductions to see whether long-run losses from monopoly outweigh the short-run gains from lower costs. A court would be required to determine the proper (competitive) prices of firms by use of elasticities, for which the courts have repeatedly demonstrated dislike. A court would also have to inquire into available technologies and managerial resources in order to find out whether an inef-

retical validity of a formula for apportioning monopoly losses among direct and indirect users of the monopolized product, but it refused to employ the formula because of its reliance on elasticities, which the Court found to be practically incalculable. Again, in cases involving mergers, it is possible to compute market power directly from elasticities rather than to use market definitions and market share as crude proxies. See R. POSNER & F. EASTERBROOK, *supra* note 1, at 347-53; Landes & Posner, *supra* note 45. Yet the Court has consistently referred to market shares and declined to explore the elasticities.

ficient firm could safely be expelled because a more efficient one was on the way. It is implausible that the techniques of litigation are sufficiently refined to permit such nice calculations.

F. Predatory Innovations

Price is not the only way in which firms compete. It is just one component of the package a consumer considers in deciding whether to buy a product. Although it is convenient for an economist to hold other things such as product quality constant and talk about the effect of price changes on competition, in practice a firm could choose to vary any element of price-product mix. A product quality increase with price held constant is as much a "price reduction" as a price decrease with product quality held constant. If predatory pricing is possible, analogous predatory product-quality changes also are possible.

Innovation, then, apparently should be treated just like predatory pricing, because innovation is simply a way of either producing a higher quality good or reducing the marginal cost of producing the same final good.⁸⁹ The first result would allow predatory quality changes; the second would create the possibility of conventional predatory pricing. If predatory pricing is unprofitable, then so apparently is predatory innovation.

But innovations introduce an additional wrinkle. Some products are complementary inputs into final goods assembled by someone else. Left and right shoes are inputs into foot transportation; cameras and film are inputs into finished photographs; central processors ("computers"), memory units, and input/output devices ("peripherals") are inputs into computation. The price and availability of one complementary product inevitably affect the demand for and price of the other. Thus, if cameras were unavailable, no one would want film. The market for left shoes depends on the availability of right shoes. If peripherals were free, there would be an increase in the demand for computers. The existence of complementary products makes it possible, at least in principle, to use innovations to predate even if predatory pricing might be unsuccessful. If, for example, peripherals made by firms *A* and *B* are uniquely adapted to computers made by firm *C*, then *C* might be able to alter the characteristics of its computers so as to make its

⁸⁹ Even the invention of a previously nonexistent good can be thought of as a reduction from an infinite price to some lower price for that good.

rivals' peripherals incompatible with the main unit and hence valueless. *C* might then be able to obtain a monopoly of peripheral manufacturing even if no pricing strategy by *C* would produce that result. This might be a rational strategy for *C* to follow: if customers used computers and peripherals in different proportions to produce computation, the second monopoly could increase *C*'s profits.

Several recent cases have considered contentions that particular innovations were predatory, with divergent results. One concludes that, as a matter of law, innovations cannot be predatory.⁹⁰ Another would find predation if the plaintiff could prove that a monopolist's innovation was "unreasonably restrictive of competition."⁹¹ The third would allow the plaintiff to prevail by proving that a package of innovations was designed to "lever" a firm from a monopoly to a competitive advantage in another market.⁹² Areeda and Turner conclude that arguments about predation by innovation are too complex to resolve by litigation, and therefore urge courts to dismiss such cases without detailed inquiry.⁹³ Ordover and Willig, on the other hand, maintain that predatory innovations are powerful exclusionary devices that should be held unlawful in litigation.⁹⁴

⁹⁰ *ILC Peripherals Leasing Corp. v. IBM*, 458 F. Supp. 423, 443 (N.D. Cal. 1978), *aff'd on other grounds per curiam sub nom. Memorex Corp. v. IBM*, 636 F.2d 1188 (9th Cir. 1980).

⁹¹ *In re IBM Peripheral EDP Devices Antitrust Litigation* (Transamerica), 481 F. Supp. 965, 1003 (N.D. Cal. 1979), *appeal docketed*, No. 80-4048 (9th Cir. Jan. 31, 1980).

⁹² *Berkey Photo, Inc. v. Eastman Kodak Co.*, 603 F.2d 263, 275-76, 285-88, 286 n.30 (2d Cir. 1979), *cert. denied*, 444 U.S. 1093 (1980).

⁹³ 3 P. AREEDA & D. TURNER, *supra* note 1, ¶ 718a.

⁹⁴ Ordover & Willig, *supra* note 1. Their proposal is criticized in Easterbrook, *supra* note 1. A number of student commentators express views similar to those of Ordover and Willig. See, e.g., Comment, *Physical Tie-ins as Antitrust Violations*, 1975 U. ILL. L.F. 224; Note, *Berkey Photo, Inc. v. Eastman Kodak Co.: The Predisclosure Requirement—A New Remedy for Predatory Marketing of Product Innovations*, 10 RUT.-CAM. L.J. 395 (1979); Note, *An Economic and Legal Analysis of Physical Tie-ins*, 89 YALE L.J. 769 (1980); Comment, 93 HARV. L. REV. 408 (1979). All of these pieces have substantial flaws. For example, the Illinois comment concentrates on whether innovations "foreclose" firms from making certain items at a profit; this confuses the welfare of competitors with the existence of competition. The Rutgers piece maintains that an innovation that reduces quality could be predatory, but it neglects the point that firms introducing inferior products usually have trouble selling them. Inferior quality would reduce the reputation of the firm and hurt sales of other product lines as well; it is usually not a desirable strategy. The Yale Note is much more sophisticated, relying on the Spence-Williamson approach, discussed in Part I-D *supra*, to argue that the innovator can seize first-mover advantages. But if the first-mover arguments are unpersuasive as applied to capacity, they also fail as applied to innovations. The Harvard Comment follows Areeda and Turner in doubting the ability of courts to determine which innovations reduce welfare, but it also suggests that innovations sometimes

Areeda and Turner emphasize an undoubtedly important problem. It is too easy to confound desirable improvements with predatory innovation (assuming such predation exists). Most of the modern approaches to predation define a price-cost relationship as the indicator of predation.⁹⁵ Below-marginal-cost selling usually can be explained only as an attempt to sacrifice current profits in order to obtain a monopoly. It may be hard to measure cost, and the sacrifice may turn out to be unprofitable, but at least there is a clearly defined phenomenon at work. The sacrifice is apparent, and it defines the offense.

Nothing similar to a price-cost comparison is available to identify an innovator's profit "sacrifice" designed to drive out rivals and establish a monopoly. All innovations involve some short-term sacrifice—the amount invested in research and development. All innovators hope to recoup this investment by selling as much of the new product as possible, becoming monopolists if they can. And the inventors of the products most highly prized by consumers succeed in these ambitions. Thus, evaluated *ex post*, any innovation may appear to be predatory; no theory could tell us, *ex ante*, how much research and development is "too much." In fact, the most desirable innovations would seem to be the most predatory, for R&D costs (the "sacrifice") and market share (the result) both may be high.

The difficulty in separating the predatory from the innocent in the judicial process is illustrated by the *Transamerica* case.⁹⁶ The court did not attempt to evaluate R&D costs to determine whether they involved "too much" sacrifice, or whether the innovation led to excessive concentration. Instead it concluded that, if a monopolist introduces a new product that has a seriously adverse effect on the monopolist's rivals in the production of complementary goods, the innovation will be deemed predatory unless the product change was "reasonable."⁹⁷ But what is "reasonable"? It will not do to say that an innovation is "unreasonably" deleterious to competition just because it sweeps the market; then the innovations most beneficial to (and so desired by) consumers would be the first to be condemned. It is also inappropriate to base the determination of

could be used to "lever" a firm from one monopoly to another. I discuss this possibility in text at notes 99-102 *infra*.

⁹⁵ See text and notes at notes 1-6 *supra*.

⁹⁶ *In re IBM Peripheral EDP Devices Antitrust Litigation* (Transamerica), 481 F. Supp. 965 (N.D. Cal. 1979), *appeal docketed*, No. 80-4048 (9th Cir. Jan. 31, 1980).

⁹⁷ *Id.* at 1002-08.

"reasonableness" on whether a product had a monopolizing effect as things turned out; the inquiry must focus on conditions *ex ante*, when the relevant decisions were made. Those circumstances may be difficult for a court to evaluate, because they may include fine points of engineering or physics. Even if a court could resolve disputes about whether the innovation was a step "forward," or determine whether consumers found the innovation desirable, that would not reveal what we need to know. The innovation must be "reasonable," but in relation to what? A requirement that the innovation not "unreasonably" restrict competition simply begs the question of what a reasonable restriction is.⁹⁸ Sometimes consumers would value an innovation that reduced product quality if it simultaneously reduced costs. The case of narrower seats in airplanes to conserve on fuel per passenger mile is an illustration. Moreover, a legal doctrine as nebulous as "reasonableness" would increase the riskiness of research and development in general. The greater the risk associated with research, the less attractive it becomes, and the lower the rate of technological progress. These problems with implementing a theory of predatory innovation are sufficient to establish that such an approach is unwise.

The central problem with the assertion that innovations can be predatory is not, however, the difficulty in implementing a legal rule. It is, instead, the lack of a convincing explanation of how innovations could reduce consumers' welfare. Predatory innovations look something like tie-ins. The innovator, which starts with a monopoly of good *X*, contrives (through changes in its product) to induce consumers to purchase good *Y* as well. IBM allegedly used changes in the multiplexing systems of its computers to induce customers to take IBM's peripherals as well;⁹⁹ Kodak supposedly invented new cameras, the "Instamatic" and the "Pocket Instamatic," in order to obtain an advantage in the film market.¹⁰⁰ The only conceivable objection to this result is the one advanced against tie-ins: that the monopolist has used the "leverage" given

⁹⁸ In *Transamerica* the court's open-ended reasonableness test apparently meant that a technologically regressive product could be unlawful, but an "improvement" would be lawful no matter what effect it had on competitors or competition. *Id.* at 1004. This simplifies the task in litigation, excluding all but engineering issues. It is not clear, though, why technological improvements could not be predatory within the court's definition if they enabled a monopolist of one product to control the market for a complementary good as well.

⁹⁹ *Id.* at 973.

¹⁰⁰ *Berkey Photo, Inc. v. Eastman Kodak Co.*, 603 F.2d 263, 269 (2d Cir. 1979), *cert. denied*, 444 U.S. 1093 (1980).

by one monopoly to obtain a second monopoly.¹⁰¹

The "leverage" objection to innovations is not plausible.¹⁰² Leverage does not work, because the monopolist's conduct imposes costs on purchasers of goods. For example, IBM's product changes reduced the value of non-IBM peripherals that IBM's customers had acquired. The customers would treat this (or the prospect of it) as an increase in the price of IBM's new, incompatible products, and buy fewer of them. Other suppliers would continue to furnish the computer-peripheral mix preferred by users, using old technology if necessary. IBM could not both collect the full monopoly profit in computers and force its customers to take IBM's peripherals. IBM would be left with both new-development costs and lower sales. If it used the innovation nonetheless to secure a monopoly of peripherals, it could not charge a monopoly price for them without reducing the demand for computers. IBM can secure only a single monopoly return.

An innovation-induced tie therefore must have uses other than simply obtaining a second monopoly for its own sake. One possibility is that the innovation enables the firm to take advantage of the different elasticities of demand of customers that use the two products in different ratios. This is the price discrimination explanation of tying. Although price discrimination increases the profitability of the monopoly, it does not necessarily make consumers worse off. Indeed, because a monopolist able to discriminate at low cost can expand its output, the discrimination actually reduces the dead-weight efficiency loss usually associated with monopoly.

Another possibility is that the innovative change in the monopolist's price-product mix is an effective way of evicting less efficient rivals from the market.¹⁰³ If this is the function of the innovation, it is unobjectionable, even desirable, for the reasons given in Part I-E. Efficiency savings of this sort may be great enough to justify even an explicit tie-in, under which IBM would refuse to sell computers to anyone who did not promise to use only IBM's

¹⁰¹ See *United States Steel Corp. v. Fortner Enterprises, Inc.*, 429 U.S. 610, 617-22 (1977) (collecting earlier cases).

¹⁰² W. BOWMAN, *PATENT AND ANTITRUST LAW* 116-18, 163-82 (1973); Bowman, *Tying Arrangements and the Leverage Problem*, 67 *YALE L.J.* 19 (1957); Ferguson, *Tying Arrangements and Reciprocity: An Economic Analysis*, 30 *LAW & CONTEMP. PROB.* 552 (1965). Telser, *A Theory of Monopoly of Complementary Goods*, 52 *J. BUS.* 211 (1979), provides a formal statement of the possible effects and uses of tie-ins. See also R. BORK, *supra* note 1, at 365-81; R. POSNER & F. EASTERBROOK, *supra* note 1, at 802-10.

¹⁰³ R. POSNER, *supra* note 1, at 194-96.

peripherals. Because even an explicit tie-in may improve consumers' welfare, there is no logical ground for objecting to an informal tie produced by innovation.

It would be unwarranted, however, to assume that the anti-trust analysis of predatory innovations depends on the appropriate treatment of explicit tie-ins. A "tie-in," under traditional doctrine, is a compulsory package deal. The monopolist of product *A* refuses to sell *A* unless the purchaser agrees to take *B* as well. If the monopolist offers both an *A-B* package and *A* by itself, there is no "tie," and no ground for antitrust complaint.¹⁰⁴ The monopolist is free to make the *A-B* package attractive to consumers, perhaps by lowering the price of *A*; there is no legal objection if the package is so attractive that consumers invariably purchase *A* and *B* together rather than separately.¹⁰⁵

Innovations with respect to complementary goods lack the coercion necessary to constitute a tie-in. When IBM introduces a computer with a new multiplexing system, it does not compel all IBM users to convert to the new system, and it does not ban users from connecting non-IBM peripherals to their new computers. When Kodak introduces a new camera system, it does not compel photographers to use Kodak film in the cameras. True, the innovator may get the jump on the suppliers of complementary goods: Kodak will have a new film ready when it introduces its cameras, and it will take time for rivals to catch up. But nothing compels any purchaser to buy both camera and film from a single seller.

An informal tie-in by innovation, subject to erosion as a result of competitors' responses, could produce a number of benefits for consumers. Most importantly, it enables the innovator to reduce the amount of free riding on its research and development. In the computer and photography industries, R&D is a substantial cost of production. Once IBM makes a product available, however, its rivals may be able to examine the unit, learn how it is made, and reproduce it without compensating IBM. When rivals can take a free ride on an innovator's research, innovators will find it unprofitable to bring some advanced products to market, and consumers will suffer.¹⁰⁶ Although the patent laws restrict free riding to some

¹⁰⁴ See, e.g., *Sorbato v. Prudential Ins. Co.*, 632 F.2d 786 (9th Cir. 1980); *Kentucky Fried Chicken Corp. v. Diversified Packaging Corp.*, 549 F.2d 368 (5th Cir. 1977).

¹⁰⁵ See *United States Steel Corp. v. Fortner Enterprises, Inc.*, 429 U.S. 610 (1977).

¹⁰⁶ The Supreme Court recognized this, although obliquely, in *Dawson Chem. Co. v. Rohm & Haas Co.*, 100 S. Ct. 2601, 2621-25 (1980).

extent, many important developments (and most "mere" engineering advances) are not patentable. The unpatentable aspects of computer and photographic technology, in particular, may be much more important than the patentable aspects, making free riding a serious obstacle to innovation.¹⁰⁷ Even when patents are obtainable, they may be unenforceable in practice. An informal tie-in produced by innovation restricts rivals' sales, and thus the amount of free riding on the innovator's work.¹⁰⁸

A second function of innovation-induced sales of complementary goods as a package is that the innovator can exercise greater control over the quality of the new product. It may be quite difficult for consumers to determine the source of any shortcoming in a new product; by definition, they will be unfamiliar with it. Yet the success of the innovation may depend on consumers' initial perceptions of quality. Only if they are satisfied will they buy again. If the innovation is simply one of a number of products used to produce a final good, the only practical way for the innovator to ensure that consumers do not misapprehend the quality of the product is to supply the complementary products as well. When Kodak introduces a new camera, consumers may be disappointed if it does not work well with rivals' old film. Consumers would be unable to determine whether the flaw lay in the camera, the film, the processing, or their combination. Rival suppliers of film and processing would not have sufficient incentive to supply the film best adapted to the new camera, because they would not bear the full costs of the unsatisfactory results. They would suffer some diminution in sales, but so would Kodak. If, on the other hand, Kodak induced customers to use only Kodak film and processing in its cameras at first, then consumers would be able to evaluate the system. Once the system had acquired a reputation for quality, the need for joint purchasers would lapse; consumers could substi-

¹⁰⁷ The fact that a particular addition to knowledge is not patentable does not imply that the information should be freely available. The Court recognized as much when it upheld state trade secret doctrines, *Kewanee Oil Co. v. Bicron Corp.*, 416 U.S. 470 (1974). The patent laws mark the limit of legally enforced exclusive rights in inventions, but firms remain free to capture the value of new information they produce by self-help (including secrecy). An innovation in product A that increases the innovator's ability to appropriate the gains of its R&D on product B is simply another self-help device for protecting the value of an investment in information.

¹⁰⁸ It is widely accepted that larger market shares enable firms to recover a larger part of their investment in information and thus support innovation. See F. SCHERER, *supra* note 44, at 423-38; Ginsburg, *Antitrust, Uncertainty, and Technological Innovation*, 24 ANTI-TRUST BULL. 635 (1979).

tute the film (or camera) of another supplier, and they would be able to pinpoint the cause of any change in performance. Other suppliers would then bear the costs or enjoy the benefits of their own level of quality.¹⁰⁹

In many cases it should be possible to determine whether these benefits exist. The test would not depend on the testimony of engineers or other technological experts. It would, instead, pose a single question: did output rise after the innovation? If output rose, the innovator could not have monopolized the market, for "recoupment" depends on a monopolistic output reduction. In most cases of supposedly predatory innovation, competition from firms vending the older product would prevent any reduction in output. Although an increase in output unambiguously demonstrates the absence of monopolization, a decline in output would not necessarily show predation. The new product may simply be more durable (such as razor blades that stay sharp ten times as long as the previous kind) or more powerful (such as computers that run ten times faster than the previous generation).

I conclude, then, that innovations cannot be called "predatory" just because they may enable a firm to control the market for complementary products or even because they lead to a reduction in output. The initial control of these markets by the innovator is beneficial to consumers because it makes innovation less risky, gives firms the incentives to undertake additional research, and enables consumers to evaluate product quality accurately. Any market power created by an innovation will be eroded as time passes and these benefits are realized for a given product. Informal tie-ins imposed through particular product introduction strategies may be more costly than straightforward tie-ins; if so, the rule against tie-ins (not the strategy itself) is the source of the cost. "Predatory innovations" might best be understood as an illustration of the proposition that if antitrust law bans one device (such as explicit tie-ins), firms will find other, more costly devices to replace it.¹¹⁰

¹⁰⁹ An innovator's interest in enabling consumers to distinguish the quality of the new product from the quality of the complementary products is enhanced by the fact that the innovator often has other similar products for sale. If IBM brings out a new computer that functions poorly because of connection to inferior peripherals, this will damage IBM's reputation for quality and thus its ability to sell other, older products. An innovator gambles its entire reputation, and it may lose. This risk is high enough without being subject to elevation as a result of decisions by competitors who do not bear the full burden of their own quality decision.

¹¹⁰ Joskow & Klevorick, *supra* note 1, at 240-41; Spence, *supra* note 40. The substitutes

Indeed, even on the assumption that innovative strategies sometimes (or always) reduce welfare, it makes little sense to attempt to suppress them. Suppose that innovative strategies have none of the benefits I have described, and that they simply increase the size of a firm's monopoly profit, whether by "leverage" or by enabling the firm to practice price discrimination. If the tie-in between computers and peripherals enabled IBM to collect \$100 in monopoly profits, it would cause a deadweight welfare loss of approximately \$50.¹¹¹ The tie itself may be relatively inexpensive to administer; perhaps administration consumes \$10 of IBM's profit. If explicit tie-ins are now banned, IBM will shift to more costly ways of augmenting its monopoly profit. It could elect to spend, say, \$30 implementing an innovative strategy that imperfectly mimics a tie-in. The innovative strategy might yield a return of \$80. This nets IBM \$50 (\$80-\$30), and it produces a deadweight loss of \$40. The total social cost of the tie-in was \$60, while the social cost of the innovative strategy would be \$70. A rule banning the innovative strategy might lead IBM to invest \$60 in still a third approach that yielded only \$65 in additional monopoly profits and produced an allocative loss of \$32.50. The social cost of this third strategy would be \$92.50. It would be better to let IBM have an explicit tie-in than to invoke costly legal processes that merely induce the firm to adopt more and more expensive strategies to augment its profits.

G. Theory Versus Practice

The discussion so far has proceeded largely on the theoretical level. I have asked whether a firm would see proposed predatory strategies as holding out significant prospects of profit and concluded that except under certain stringent assumptions the potential predator would find significant risks and little potential for profit. But it is not possible to conclude, as a matter of theory, that predation is never profitable. The question ultimately is empirical. It is therefore necessary to determine whether profitable predation occurs in practice often enough to be a subject of serious attention.

It is useful, in this respect, to compare predation with another economic phenomenon that cannot be excluded solely on the level

are necessarily more costly and less effective; otherwise, the monopolist would have chosen to use them in preference to the tie-in.

¹¹¹ See note 85 *supra* for the formula for calculating the allocative loss. For an explanation of why that loss approximates $\frac{1}{2}$ the monopoly overcharge, see note 144 *infra*.

of theory: the problem of second best.¹¹² Few markets, if any, have the characteristics of perfect competition. Every firm has some power over price; the government creates impediments to entry; and no firm can add instantaneously and smoothly to output. Because of these and other divergences from the competitive model, monopoly sometimes improves the allocation of resources. For example, if poultry slaughtering is monopolized, should we break up the monopoly? In theory, we cannot answer that question until we know whether poultry raising or retailing is monopolized. The slaughtering monopoly may be a "second best" arrangement—not as good as competition in all markets, but better than the state of affairs with a monopoly and a monopsony squeezing a competitive slaughtering business.

If we took the problem of second best seriously, we could not resolve any antitrust case until the court had examined all of the defendant's suppliers and customers. Instead, courts ignore the problem of second best for two reasons, each sufficient. First, it raises problems too complex for adjudication; second, there is no reason to believe that the problem of second best is serious. Most economists strongly suspect, even though they cannot prove, that a policy of declaring all cartels unlawful will do much more good than harm.

The same reasons that lead courts to ignore the problem of second best should lead them to ignore alleged predation. I have argued above that litigation in predation cases requires delving into matters of substantial complexity. Every proponent of a predation test argues that the tests proposed by other scholars are impractical. I think they are all correct. In Parts II and III, I develop in more detail the reasons why the difficulty in implementing any rule against predation should caution against having one at all.

The available evidence also indicates that predation occurs infrequently, if at all. Studies of many industries find little evidence of profitable predatory practices in the United States or abroad.¹¹³

¹¹² For descriptions of the problem of second best, see 2 P. AREEDA & D. TURNER, *supra* note 1, ¶ 411; R. POSNER, *supra* note 1, at 13-14; F. SCHERER, *supra* note 44, at 24-29; Lipsey & Lancaster, *The General Theory of Second Best*, 24 REV. ECON. STUD. 11 (1956).

¹¹³ See, e.g., B. FOG, INDUSTRIAL PRICING POLICIES 147-51 (1960); Elzinga, *Predatory Pricing: The Case of the Gunpowder Trust*, 13 J.L. & ECON. 223 (1970); Kamerschen, *Predatory Pricing, Vertical Integration and Market Foreclosure: The Case of Ready Mix Cement in Memphis*, 2 INDUS. ORGANIZATION REV. 143 (1974); Koller, *The Myth of Predatory Pricing: An Empirical Study*, ANTITRUST L. & ECON. REV., Summer 1971, at 105 (investigation of 31 alleged incidents of predation); McGee, *Government Intervention in the Spanish*

These studies are consistent with the result of litigation; courts routinely find that there has been no predation.¹¹⁴ The cases reach that result not simply because they have adopted the Areeda-Turner test—a very stringent one from plaintiffs' point of view—but also because they consistently conclude that the defendant did not sell below cost or sacrifice short-term profits in any other way in order to obtain a monopoly. Even the cases that reject the Areeda and Turner approach in favor of a standard more favorable to plaintiffs nonetheless find no predation.¹¹⁵ This absence of proof of predation under any theory is significant. The availability of treble damages and the desire to protect one's market position give the

Sugar Refining Company, 1887-1914: The Story of Monopoly, 12 J.L. & ECON. 339 (1969); McGee, *Ocean Freight-Rate Conferences and the American Merchant Marine*, 27 U. CHI. L. REV. 191 (1969).

One example occasionally invoked to show the existence of predation is the international shipping cartel, the subject of *Mogul S.S. Co. v. McGregor, Gow & Co.*, 23 Q.B.D. 598 (1889), *aff'd*, [1892] A.C. 25 (1891). See F. SCHERER, *supra* note 44, at 337-38, 338 n.13; Yamey, *Predatory Price Cutting: Notes and Comments*, 15 J.L. & ECON. 129 (1972). McGee, however, maintains that the "fighting ships" used by the cartel were a competitive response to overcapacity and a decline in demand. McGee, *Ocean Freight-Rate Conferences*, *supra*, at 249-50. See also A. FERGUSON, E. LERNER, J. MCGEE, W. OI, L. RAPPING & S. SOBOTKA, *THE ECONOMIC VALUE OF THE U.S. MERCHANT MARINE* 406-13 (1961). Even if McGee is wrong, the shipping cartel's predation does not offer significant support for the proposition that predation generally is likely to be profitable. That case involved a real cartel, which could have been attacked under standard antitrust doctrines without regard to whether it resorted to predation. The cartel was not attacked by antitrust enforcers; to the contrary, it was protected by regulatory agencies against new entry. A governmentally protected monopoly is the most favorable environment for a predator.

¹¹⁴ See cases cited note 31 *supra*.

¹¹⁵ See *Chillicothe Sand & Gravel Co. v. Martin Marietta Corp.*, 615 F.2d 427, 432 (7th Cir. 1980); *In re IBM Peripheral EDP Devices Antitrust Litigation* (Transamerica), 481 F. Supp. 965 (N.D. Cal. 1979), *appeal docketed*, No. 80-4048 (9th Cir. Jan. 31, 1980). See also *E.I. du Pont de Nemours & Co.*, 987 ANTITRUST & TRADE REG. REP. (BNA) F-1 (F.T.C. Oct. 30, 1980), in which the Commission concluded that a very large increase in du Pont's capacity to make titanium dioxide was not a violation of the antitrust laws. The capacity expansion in *du Pont*, which was accompanied by the implementation of a new process characterized by high fixed costs and low marginal costs, would have been a prime candidate for designation as a predatory commitment, see Part I-D *supra*, if such a commitment were a plausible predatory strategy.

Borden, Inc., 92 F.T.C. 669 (1978), *appeal docketed*, No. 79-3028 (6th Cir. Jan. 12, 1979), and *Photovest Corp. v. Fotomat Corp.*, 606 F.2d 704 (7th Cir. 1979), *cert. denied*, 445 U.S. 1093 (1980), are the only recent findings of predation. *Photovest* is discussed in text at notes 121-122 *infra*. *Borden* is on review, and the administrative opinion does not repay examination. *Borden* never reduced prices below marginal cost. 72 F.T.C. 753-54, 800-01. The case might be seen as an example of signalling, but the Commissioners were unable to agree on why *Borden's* pricing of *ReaLemon* was unlawful; the case has overtones of price discrimination law (*Borden* charged different prices in different sections of the country) and of "unfair practices" law under section 5 of the Federal Trade Commission Act, 15 U.S.C. § 45 (1976). It remains to be seen whether the courts will agree with the decision in *Borden*.

private parties who are the victims of any predatory conduct a substantial incentive to detect and prosecute predation when it occurs. If these highly motivated plaintiffs have not turned up a compelling case of predation, it is unlikely that any exists.

Three responses could be made to this argument. First, the courts and scholars may have been wrong in concluding that there was no predation in the cases they examined. Second, predation might escape detection and so not lead to litigation or academic scrutiny. Third, existing rules against predation might effectively deter the practice, but predation would occur if it were lawful.

The second objection is feeble. Predation may be hard to prove, but it is not readily concealable. A victim driven from the market by a low price is aware of its injury. It may not know whether the injury was caused by lawful competition as opposed to predation, but that would not matter. The firm could file suit and seek to discover its rival's costs. In addition, one of the theories most commonly advanced to explain predation, the signalling model,¹¹⁶ actually requires that the predator's rivals be aware of its conduct. Any messages sent by a firm with a multimarket monopoly are worthless unless received. Likewise, any strategy that depends on influencing the anticipated returns of prospective entrants necessarily involves signals that could support lawsuits.

The third objection also is weak. There are few, if any, examples of profitable predation before the Sherman Act or in other countries, despite the absence of laws against the practice. Moreover, no deterrent is perfect; some persons always will conclude that they can make more by violating the rules than they stand to lose in penalties. Firms fix prices despite the Sherman Act. Some firms should also conclude that predation, if profitable, is worth the antitrust risk. The more profitable the practice, the more attractive the risk.¹¹⁷ All that the prohibition does is prevent minimally or moderately rewarding predatory conduct. The litigated cases therefore should involve the most egregious instances of predation, that is, the ones most profitable to the predator. An examination of these cases should disclose whether predation is a serious problem.

¹¹⁶ See Part I-C *supra*.

¹¹⁷ The customary damages in a predatory-pricing suit are measured by the victim's lost profits. As shown below, see text and notes at notes 136-143 *infra*, these lost profits are not related to the predator's gain. If predation were profitable, the prospect of lost profits damages often would be insufficient to deter the practice.

This brings me back to the first objection: that the courts and scholars erred in continuously finding no predation. It would be tedious and unilluminating to examine very many cases. I limit my attention here to two examples that seem to present the best chances for a finding of profitable predation: one case in which a firm cut price below marginal cost, and another in which a firm drove a rival out of the market.¹¹⁸

In *United States v. Empire Gas Corp.*,¹¹⁹ Empire sold liquified petroleum gas in many geographic markets, while most of its competitors sold in only one. This gave Empire the ability to signal its willingness to cut price from one market to another. It apparently attempted to do just that.¹²⁰ Although the wholesale price of liquified petroleum gas was 9.7 cents per gallon, Empire set a retail price in some markets as low as 9 cents. Empire explicitly threatened competitors in other markets with similar cuts unless they stopped soliciting sales and increased their prices to 15.9 cents per gallon. The evidence showed a pattern of competition, predation, and ensuing higher prices in several markets.

By anyone's definition, Empire's conduct was predatory. Yet the court of appeals found no antitrust violation, because Empire did not achieve a "dangerous probability of success" of monopolizing the market. Its market share in the market selected by the government as most favorable did not exceed 50%. In other words, Empire was in no position to recoup its investment in predation. The record showed that the predation-induced price increases quickly collapsed, leaving Empire with little but losses to show for its efforts. It failed under what seemed to be model conditions. Empire was diversified and had ample access to credit, while its competitors did not. It could take advantage of a demonstration effect to induce cooperation in several markets without actual predation in more than one. Yet rival after rival survived the predation and continued to compete. Long-term contracts with gas cus-

¹¹⁸ *Berkey Photo, Inc. v. Eastman Kodak Co.*, 603 F.2d 263 (2d Cir. 1979), *cert. denied*, 444 U.S. 1093 (1980); *In re IBM Peripheral EDP Devices Antitrust Litigation* (Transamerica), 481 F. Supp. 965, 1003 (N.D. Cal. 1979), *appeal docketed*, No. 80-4048 (9th Cir. Jan. 31, 1980); and *ILC Peripherals Leasing Corp. v. IBM*, 458 F. Supp. 423 (N.D. Cal. 1978), *aff'd per curiam sub nom. Memorex Corp. v. IBM*, 632 F.2d 1188 (9th Cir. 1980), provide further examples of apparently successful exclusion of rivals that was not predatory. See text and notes at notes 90-111 *supra*.

¹¹⁹ 537 F.2d 296 (8th Cir. 1976), *cert. denied*, 429 U.S. 1122 (1977).

¹²⁰ It also allegedly used some stronger methods to discourage competition, such as blowing up its competitors' plants. Empire's president was, however, acquitted of criminal charges. See *id.* at 298 n.1.

tomers came into use. Even if those particular rivals had vanished, others would have appeared, for there were no barriers to entry in the liquified petroleum gas market. Empire's conduct is an illustration of self-detering predation, which should not concern the legal system.

The other case is *Photovest Corp. v. Fotomat Corp.*,¹²¹ in which the plaintiff actually went out of business as a result of the defendant's conduct, and the court of appeals concluded that there had indeed been predation. But *Photovest* nonetheless is an unlikely candidate as a case of profitable predatory conduct. It involved a franchisor's replacement of franchisee-owned stores with company-owned stores. Fotomat, the franchisor, had opened a number of outlets, selling film and processing at low prices, and so made life difficult for the franchisees. The court's conclusion that this conduct is predatory seems strained. Fotomat did not end up with any ability to collect monopoly profits. Although it was the only franchisor of drive-through photo kiosks, the customers' ability to go to drugstores for film and processing put a cap on Fotomat's price. Without monopoly power, Fotomat would have been unable to recoup any of its expenditures on predation.

Moreover, even if the court was right about the relevant market being drive-through photo processing, Fotomat's conduct could not possibly have harmed consumers. If Fotomat's franchisee had a monopoly of the local drive-through market at the beginning, and Fotomat itself had a monopoly at the end, then the consumers lost nothing and gained at least a little: they saved on film during the price war. Calling the battle between franchisor and franchisee predation simply discourages firms from providing that benefit to consumers. At all events, Fotomat did not need a price contest to extract any monopoly profit available in the market. It could have done so in franchise fees. Thus it had little to gain from predation against the producers of those fees.

One plausible explanation for the contest between Fotomat and Photovest is that the franchisee was shirking. Perhaps the franchisee was taking a free ride on the goodwill established by other users of the Fotomat trademark and providing inferior service. Photovest could charge the usual price, and the burden of customer dissatisfaction would be scattered among all of Fotomat's outlets. Ordinarily, franchise contracts contain a termination

¹²¹ 606 F.2d 704 (7th Cir. 1979), *cert. denied*, 445 U.S. 917 (1980).

clause that allows a franchisor to penalize the franchisee for inferior performance,¹²² but the contract with Photovest might have required excessive notice. Fotomat's introduction of company-owned stores could have been designed to induce Photovest to improve its performance or surrender the territory; a contract clause providing for termination on short notice could have achieved the same objective. A franchisor's termination of a franchise is not predation by any intelligible standard. *Photovest*, far from establishing the existence of profitable predation, probably was a contract dispute in the guise of an antitrust case.

II. OPTIMAL ENFORCEMENT

I have argued so far that predation is likely to be unprofitable and that judicial remedies therefore are unnecessary. Would-be predators experience as private costs any reduction in welfare caused by their activities, and it is therefore unlikely that they actually will predate. If this is correct, there is no need to go further. Even if I am wrong, however, it does not follow that the legal system should attempt to penalize predation. The welfare loss from profitable predation is not the only relevant cost. Society's welfare is highest when the legal rule holds to a minimum the *sum* of (1) the welfare loss from predation and any ensuing monopoly; (2) the welfare loss from incorrectly penalizing ordinary competition that has been mistaken for predation and the related loss caused by competitors' tempering their competition to reduce their exposure to penalties; and (3) the costs of administering an antipredation rule. This part explores these costs, assuming for the sake of argument that some profitable predatory strategies exist.

There is substantial agreement that the legal rule should be designed to hold administrative costs to a minimum, although the tests proposed so far vary dramatically in ease of administration.¹²³ Advocates of proscribing predation have been less careful in attending to the problem of false positives (cost (2) above). Only Jos-

¹²² On the economic rationale for termination clauses in franchise contracts, see Klein, Crawford & Alchian, *Vertical Integration, Appropriable Rents, and the Competitive Contracting Process*, 21 J.L. & ECON. 297, 302-07 & n.22, 319-22 (1978); Rubin, *The Theory of the Firm and the Structure of the Franchise Contract*, 21 J.L. & ECON. 223 (1978).

¹²³ Scherer's amorphous approach and the Ordover and Willig family of tests call for consideration of all conceivable factors. They amount to setting a price commission over the entire economy. See Easterbrook, *supra* note 1; Williamson, *Predatory Pricing*, *supra* note 1, at 288 n.16. The Areeda-Turner approach is much easier to apply, because it turns entirely on cost-price comparisons. The other tests are somewhere in between.

kow and Klevorick seriously attempt to examine this problem,¹²⁴ and they do so by describing the way in which error costs change with differences in the structure of an industry rather than by determining their absolute size.¹²⁵ I approach error and administration costs from a different perspective. I discuss the way in which a damages remedy, available to private plaintiffs, would be used to enforce a ban on predation. The analysis shows that existing antitrust doctrines, which permit recovery of "overcharges" or "lost profits" in suits by the alleged victims of predation, lead to too much enforcement of any rule against predation.

A. Computing Optimal Damages

Antitrust offenses are wholly economic crimes. Firms engage in predation and other offenses for profit, and antitrust policy, including its penal aspects, is designed to deter violations by reducing their profitability. Deterrence is thus the first, and probably the only, goal of antitrust penalties. If awarding damages to an injured party also compensates him, that is just a pleasant by-product.¹²⁶

The first requisite of deterrence is that the remedy make the violation unprofitable. In the case of a cartel, for example, the rule would take away from the conspirators the entire monopoly overcharge. This is shown in Figure 3 as rectangle ABCD. The monopoly output is q_m , which is sold at price p_m . The overcharge is the difference between price and marginal cost (which is also the competitive price, p_c) times the quantity sold at the monopoly price. If the monopolist's profit (rectangle ABCD) is removed by a damages award, the incentive to monopolize disappears. The standard dam-

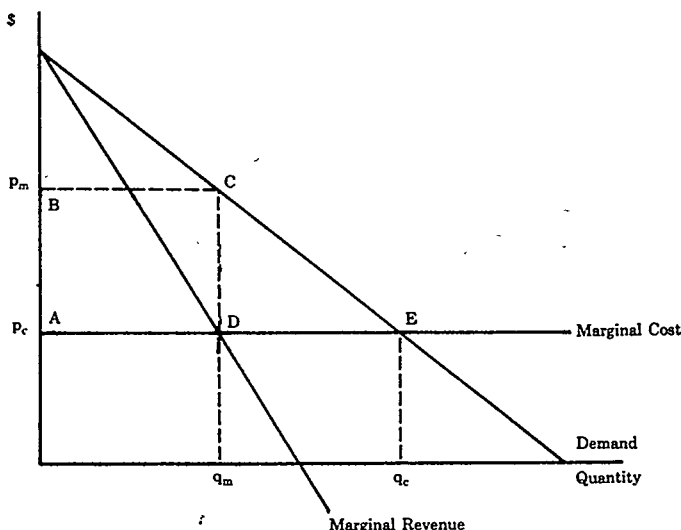
¹²⁴ Williamson, for example, concedes that he has ignored the problem of false positives. Williamson, *Predatory Pricing II*, *supra* note 1, at 1198.

¹²⁵ Joskow & Klevorick, *supra* note 1, at 223-25.

¹²⁶ The Supreme Court's recent decisions on antitrust remedies appear to recognize this. *Brunswick Corp. v. Pueblo Bowl-O-Mat, Inc.*, 429 U.S. 477 (1977), holds that a person injured by an antitrust violation cannot recover just because he has suffered loss. The loss must flow from that that made the conduct unlawful. And *Illinois Brick Co. v. Illinois*, 431 U.S. 720 (1977), which allowed direct purchasers to recover the entire damages from a price-fixing conspiracy, did so in order to achieve the appropriate deterrence at the least cost. The decision assigned recoveries to purchasers who may not have been injured and denied recovery to injured ultimate consumers, but the Court concluded that adequate deterrence should be preferred to a fair system of compensation. See Page, *Antitrust Damages and Economic Efficiency: An Approach to Antitrust Injury*, 47 U. CHI. L. REV. 467, 472-76 (1980), for an extension of the argument that deterrence is or should be the sole objective of antitrust damages.

ages rule in antitrust litigation, awarding the monopolist's customers the amount of the overcharge,¹²⁷ does exactly this.

FIGURE 3



A damages award that simply relieves the violator of what it took from the victim does not, however, take account of the total harm the violation causes to consumers, as the optimal award would. In the case of a monopoly, the costs borne by consumers include triangle CDE in Figure 3. This is the deadweight or allocative efficiency loss. The total loss also includes the costs of apprehending and prosecuting the violator. Gary Becker has shown that a fine or damages recovery of (a) the amount transferred from victim to offender, plus (b) the social welfare loss caused by the offense, less (c) the cost of defending against a charge (which amounts to an automatic fine) will deter all inefficient offenses.¹²⁸

¹²⁷ See *Illinois Brick Co. v. Illinois*, 431 U.S. 720 (1977); *Chattanooga Foundry & Pipe Works v. City of Atlanta*, 203 U.S. 390 (1906).

An "overcharge" measured by quantity sold times the difference between price and marginal cost actually overstates the monopoly overcharge. Figure 3 depicts a constant marginal cost. But if marginal cost rises, as it commonly does, then the competitive price will be higher than the monopolist's marginal cost at its (restricted) output. The monopoly overcharge actually is the difference between the competitive and monopoly prices. There is, however, no satisfactory way to determine industry marginal cost at the competitive output. Consequently, it is necessary in practice to use the difference between the monopolist's marginal cost and price as the best available measure of the overcharge.

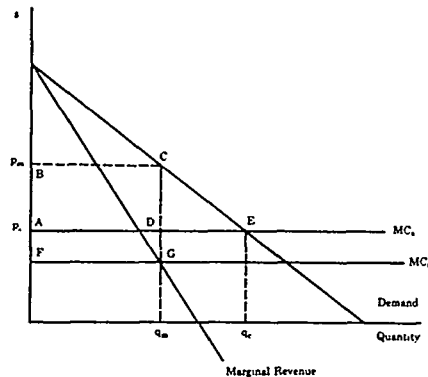
¹²⁸ Becker, *supra* note 37, at 190-93. The damages so computed also should be divided by the probability of detecting and prosecuting the offense successfully; I postpone consider-

The "inefficient offense" description is important, because conduct that technically violates a legal rule could yield net social benefits. Few legal rules are designed to extinguish all conduct denominated as "illegal." Conduct is made illegal when it usually reduces welfare, and damages rules can be chosen that allow the (few) beneficial instances of the conduct to persist. Suppose two firms merged and gained a monopoly. They might be able to reduce the cost of production at the same time that they began to charge monopoly prices. A rule that sets damages as the monopoly overcharge plus the deadweight monopoly loss would force the firms to compare the deadweight loss with the savings in productive efficiency. If the savings exceeded the loss the firms would merge, pay the damages, and still have a profit.¹²⁹ We would not object to any merger in which the firms were willing to pay these damages, because they would all be marked by net increases in welfare. If damages were set too high, though, some of these merg-

ation of this complication to Part II-D *infra*.

¹²⁹ The damages award in case of a merger would be trapezoid ABCE in Figure 4. The cost savings would be rectangle ADGF, which the merged firms would collect as additional profit. As a first approximation, the merger is socially beneficial whenever area ADGF is larger than area CDE, the deadweight loss, because the monopoly overcharge represented by rectangle ABCD cancels itself out (it is taken in by the monopolist, then paid out in fines). Unlike the usual case discussed in note 127 *supra*, we know the competitive price here: it is what the firms were charging before the merger. It is therefore unnecessary to use the monopolist's lower marginal cost in computing the overcharge in this instance. Oliver

FIGURE 4



Williamson has argued that courts should attempt to compute the size of these areas and uphold mergers in which the cost savings exceed the allocative loss. See Williamson, *Economies Revisited*, *supra* note 80. That daunting undertaking can be avoided by an optimal damages rule, because the firms, which have the best information about their own costs and savings, can make the necessary computations. See also R. POSNER & F. EASTERBROOK, *supra* note 1, at 549-53, 920-21.

ers would not occur. The antitrust rule then would reduce social welfare.

The recognition that damages can be too high is an essential first step in dealing with practices that, depending on circumstances, might be either desirable or undesirable. Just as the penalty for mergers would be too high if it deterred combinations in which the cost reductions exceeded the allocative loss, so the penalty for predatory pricing would be too high if it deterred price reductions or innovations that were the product of hard competition. Indeed, because the acts that could be called predatory—cutting price, increasing output, building a larger plant, introducing a new product—usually are marks of desirable competition, it is especially important that the damages awarded in predation cases not exceed the optimal amount.¹³⁰

I use the term “false positive” to refer to the imposition of a damages remedy higher than optimal, because such a remedy would choke off desirable price reductions. The availability of

¹³⁰ The academic literature on antitrust damages by and large ignores the question of optimal sanctions. Areeda and Turner, for example, while recognizing the deterrent aim of antitrust law, couple it with a compensatory aim. They barely hint at optimality considerations, and then only in the paragraphs on violations without damages. 2 P. AREEDA & D. TURNER, *supra* note 1, ¶¶ 343-347.

K. ELZINGA & W. BREIT, *THE ANTITRUST PENALTIES: A STUDY IN LAW AND ECONOMICS* (1976), ignore optimality considerations in suggesting that penalties be measured by the violators' overall profits rather than by the gain from the violation.

Harrison, *The Lost Profits Measure of Damages in Price Enhancement Cases*, 64 MINN. L. REV. 751 (1980), recommends that damages be based on the “lost profits” of purchasers from a cartel. Harrison advocates a lost profits measure in order to deal with the “lost volume problem,” a shorthand description of the monopolist's reduction in output from q_C to q_M ; traditional overcharge remedies, Harrison observes, do not consider this loss. Harrison's approach, though, does not consider optimal deterrence; lost profits measures are related loosely, if at all, to the monopolist's gains. See Part II-C *infra*. Moreover, it is not possible to compute lost profits without substantial information on the elasticities of supply and demand—information that, as I have suggested above, probably cannot be provided in litigation. See also Landes & Posner, *supra* note 88, at 615-21.

The most recent essays on antitrust damages have begun to consider optimal sanctions. For example, Schwartz, *An Overview of the Economics of Antitrust Enforcement*, 68 GEO. L.J. 1075, 1081-85 (1980), discusses sanctions in economic terms but makes a number of errors. He asserts, for example, that all violations should be deterred and that the optimal sanction is the deadweight welfare loss, overlooking the need to deprive the violator of the monopoly overcharge in order to induce him to compare efficiency gains against the amount of this loss. Note, *Rethinking Antitrust Damages*, 33 STAN. L. REV. 101, 117-18 (1981), would set damages at the size of the overcharge (disregarding the welfare loss) and approximate that sum by the amount of the victim's lost profits. Page, *supra* note 128, at 484-87, 493-96, who elaborates on the principle of optimality, also contends that the reduction in going concern value or some other measure of lost profits is the appropriate sanction. I discuss this suggestion in Part II-C *infra*.

damages exceeding the optimal amount leads to false positives in the more usual meaning of that term as well. The number of suits increases with the amount of damages. If the rule for distinguishing predation from hard competition does not produce a clear result in every case, then errors in adjudication inevitably will occur. If, for example, 100 cases are filed, 10 involving predation and 90 hard competition, and the error rate is 10%, then there will be 9 false positives ($90 \times .1$) and 1 false negative ($10 \times .1$). The legal system can reduce the incidence of false positives by making the application of the legal rule more predictable, but it also can reduce their number by lessening the incentive to file suits. Calculating the optimal damages should reduce the number of suits, and thus the number of errors, even if the legal rule is no more precise than before.

The optimal damages rule for monopoly or cartel pricing is easy to state. That rule, however, is not the appropriate one for predatory pricing, even though the main objection to predation lies in the ensuing monopoly pricing. A cartel makes monopoly profits simply by cutting back production and raising prices; the monopoly overcharge is thus a reasonable measure of the cartel's profits. The predator, on the other hand, must make a substantial investment in driving rivals from the market. The monopoly profit it seeks is not the overcharge, but the overcharge minus the investment. If a predator spends \$99 to drive out a rival and then collects a monopoly overcharge of \$100, its monopoly profit is only \$1. A fine of \$1.01 therefore should deter this offense.

If the optimal fine is the wealth transfer from the violation plus the deadweight welfare loss caused by the predator's conduct, then the court could proceed in predation cases as follows. It should compute the overcharge plus the value of the allocative loss and subtract from this the value of the investment in predation¹³¹ and the costs the firm incurs in litigation, as this cost amounts to

¹³¹ The amount invested by the predator is approximately equal to the gain received by consumers during the predatory episode. Because the optimal damages remedy equals the consumers' loss (both the overcharge and the allocative welfare loss), it is necessary to net out from the predator's overcharge the undercharge during the initial period. The investment would amount to areas A and B from Figure 1 *supra*.

Notice that this implies that area C from Figure 1 should *not* be subtracted from the predator's monopoly overcharge in computing damages. The consumers who purchase only because of the predatory cost reduction are generating a welfare loss, for they value the good at less than the marginal cost of producing it. The predator already bears this welfare loss as a private loss during the time of predation, and it should be disregarded in subsequent computations of the penalty.

an automatic fine. The result is a first approximation of the optimal sanction.

An adjustment of this sum would be necessary. When the predator embarks on its campaign, it does not know whether it will succeed. The intended victim may survive the fight, or market conditions may change after the victim has departed, thus precluding recoupment. When a firm is uncertain whether it can predate successfully, it proceeds with the campaign only if, when viewed *ex ante*, it is more profitable than lawful investments. If, for example, the predator thought there was one chance in two that the campaign would succeed, it would undertake the predation only if the returns from the successful campaign equalled at least twice the cost, plus at least twice the competitive return on the amount invested.¹³²

Optimal damages should be computed from the same *ex ante* perspective. Suppose a predatory campaign would cost \$150, would succeed one time in five, and if successful would lead to a monopoly overcharge with a present value of \$1,000. It would also impose a deadweight loss with a present value of \$500 on consumers. Over a run of five similar cases we want to collect from predators \$1,500 (the transfer payment plus the deadweight loss), less the benefits conferred on consumers during the predatory campaigns (the \$750 spent on predation). The total optimal fine for the five similar cases thus is \$750.¹³³

The allocation of that fine among the five episodes raises diffi-

¹³² It must be "at least twice" because the firm may be risk averse.

¹³³ An example may show how the fine works if the predator is able to obtain some production cost savings as a result of becoming a monopolist. Suppose the savings are \$400. The predator would compute its costs of conducting a campaign as \$150 (the expenses of the campaign), plus \$150 (the actuarial value of the \$750 fine, which would be paid one time in five). The predator's benefits would be \$200 (the actuarial value of the monopoly profits, which it would obtain one time in five) plus \$80 (the actuarial value of the \$400 production cost savings). Because the costs of \$300 exceed the benefits of \$280, the damages award would deter the prospective predator, as it should, because the \$500 deadweight loss exceeds the \$400 cost savings. But if the cost savings were \$501, the predator's benefits from the campaign would be \$200 (= \$1,000 x .2) plus \$100.20 (= \$501 x .2), for a total of \$300.20. The predator then would embark on the campaign, as it should, given the net social gain of \$1 (the \$501 cost savings minus the \$500 deadweight loss). If, however, the damages award in cases of successful predation were \$1,500 instead of \$750, the firm would not engage in this campaign of "beneficial predation."

I do not suppose that firms actually go through computations of this sort. But to the extent they do not, the market and the legal system will penalize them for their oversight. See Easterbrook, Landes & Posner, *Contribution Among Antitrust Defendants: A Legal and Economic Analysis*, 23 J.L. & Econ. 331, 345 n.40 (1980). An optimal damages rule creates the right incentives for a firm sensitive to such things.

cult questions, however. If only successful predators become defendants, we should collect the entire \$750 from each defendant. This is the preferable method. The four unsuccessful firms pay automatic penalties, and it is less costly to litigate in one case than in all five. If, however, it seems likely that some rivals injured by the predatory campaign will bring suit and recover damages even though the campaign fails, the recovery should be less than \$750. For instance, if victims will recover in all five cases, the recovery should be only \$150 per case. Thus, if the court cannot tell what proportion of all predatory episodes end in litigation and in what proportion of those cases the plaintiff is successful, then it also cannot determine how to allocate the \$750 total recovery among the plaintiffs in whichever cases are litigated.

One can summarize the propositions so far as follows. The optimal damages award in any antitrust case is the amount transferred from victim to offender, plus the deadweight welfare loss caused by the overcharge. In a predation case the award must be reduced to take account of (a) the possibility that the campaign will fail, and (b) the fact that the predator bears its investment in predation as a self-inflicted fine. The optimal award is the *ex ante* value of the transfer payment and deadweight loss, minus the costs of predating, which will approximate the benefits conferred on consumers. It may be impossible to determine the size of this award if the court does not know what proportion of all predatory episodes end in successful litigation.

B. Overcharges As Damages

There are serious problems in calculating and awarding the damages I have described. Who has a claim to the award? Not the consumers who bought from the predator at low prices; they were benefited, not harmed, by the predation. Apparently not the customers who will be injured in the future when the predator tries to recoup; they are unidentifiable, and none has an appropriate incentive to search for and prosecute violations.¹³⁴ In antitrust law, when consumers' suits are unsatisfactory, competitors' suits serve to extract the penalty from the wrongdoer. The law of predation therefore has developed entirely through competitors' suits, even though the competitors do not suffer the harm (the monopoly overcharges and ensuing deadweight loss) with which the antitrust

¹³⁴ See Landes & Posner, *supra* note 88, at 608-15. But see Part II-E *infra*.

laws are concerned.

But how could any sum certain be awarded to the competitor-victim of predation? The court would need to know two things: the probability that predatory campaigns similar to this one would succeed, and the discounted value of the monopoly profits in the event of success. Unfortunately, it could not determine either number. The monopoly profits to be discounted would depend on the elasticity of demand in the future, which probably is unknowable even in principle, let alone in practice, and on the conditions of entry into the market, which would control the length of time the predator could enjoy the monopoly. The court would also need to know the predator's future costs in order to determine the monopoly overcharge. Data on current costs are difficult to establish and not always helpful; estimates of future costs would be raw speculation.¹³⁵

The court also lacks the ability to reduce the award to take account of the likelihood that the predation would fail. It would have no way of knowing how many cases of unsuccessful predation were not brought to its attention because they were neither sued on nor noticed by scholars. The court therefore would have no sound basis for computing optimal damages, and it is necessary to find a substitute measure. Yet no such substitute is apparent.

C. Lost Profits as a Proxy

One possible proxy for the optimal award is the profits the victim loses because of the predation.¹³⁶ But this figure bears no relationship to the optimal damages. If the market is competitive, the victim's "profits" are simply an ordinary rate of return on its investment, including goodwill.

Courts sometimes suggest that reduction in "going concern

¹³⁵ The difficulty is illustrated by *Aeronautical Radio, Inc. v. FCC*, No. 77-1333 (D.C. Cir. Nov. 5, 1980), *petitions for cert. filed*, 49 U.S.L.W. 3620 (U.S. Feb. 9, 1981) (No. 80-1343), 49 U.S.L.W. 3664 (U.S. Feb. 20, 1981) (No. 80-1408). AT&T asked the FCC for permission to set price in competitive markets at any amount exceeding the long-run incremental cost of providing the service. The FCC rejected the proposal because it concluded, among other things, that it would not be able to determine this cost reliably. The court of appeals sustained the FCC's decision. If the FCC, which has built up extensive data concerning AT&T over the years, cannot make reliable decisions based on long-run incremental costs, it would be futile to ask courts to make future cost projections about firms encountered fleetingly in litigation.

¹³⁶ See *Zenith Radio Corp. v. Hazeltine Research, Inc.*, 395 U.S. 100, 124-25 (1969), approving a lost profits remedy for excluding a rival from the market.

value" is the proper remedy for predation.¹³⁷ The going concern value is the present value of a firm's expected profits in the market in which the predation occurred, less the present value of the profits in some other market to which it turns after the predation. Analytically, the reduction in the going concern value is identical to a measure of lost profits. If the assets of the victim are specialized to a particular business, then the decrease in going concern value and the loss in profits are positive. But if the assets are not specialized, then the going concern value, like the economic profit, is zero in competition. The firm could make equally profitable use of its assets in other endeavors. The going concern value therefore would be a rough measure of the victim's market power before the predation, that is, of the victim's ability to sell at more than marginal cost (because only then will the victim be earning more than the competitive rate of return it could earn in other endeavors). This restatement suggests a serious problem with the use of lost profits measures of damages.

Compare the circumstances of victims of predation in two markets. In Market One, Victim One and Predator One have formed a cartel. They sell at twice marginal cost, each making monopoly profits of \$1,000 per year. Each has assets perfectly transferable to other uses in competitive markets. In Market Two, the predator and victim have been competing vigorously and selling at marginal cost. Again the assets and goodwill are perfectly transferable. Now predation occurs in both markets; Victim One and Victim Two depart, choosing to employ their assets and goodwill in another market. Assume that barriers to entry protect the monopolies established by Predator One and Predator Two. Both victims bring suit. If the discount rate is 15%, Victim One will recover \$6,667,¹³⁸ the reduction in going concern value caused by shifting its assets from the cartelized market to a competitive market. Victim Two will recover nothing; its assets are as profitable in their new application as in the old, so it experiences no compensable reduction in going concern value.

This is perverse. There was no allocative loss, and no increase in monopoly profits, from the predation in Market One. A monop-

¹³⁷ See *Standard Oil Co. v. Moore*, 251 F.2d 188, 219-20 (9th Cir. 1957), *cert. denied*, 356 U.S. 975 (1958); *Vandervelde v. Put & Call Brokers & Dealers Ass'n*, 344 F. Supp. 118, 150 (S.D.N.Y. 1972).

¹³⁸ This equals the present value of a perpetual stream of \$1,000 per year profits.

only merely replaced a cartel.¹³⁹ In Market Two, however, the allocative loss would be significant, because the predator obtained a monopoly and began charging monopoly prices. Yet Victim Two's nonrecovery would do nothing to deter this more serious instance of predation.

In practice, assets and goodwill cannot be transferred from one market to another without cost. A victim of predation could always show some reduction in the going concern value. But this does not detract from the principal point that a going concern measure of damages is inversely related to the optimal damages discussed above.¹⁴⁰ The change in going concern value of the victim is low whenever the allocative loss from the predation is high.¹⁴¹

Richard Posner and I tentatively offered a different rationale for the award of lost profits in predation cases. Instead of treating profits as a proxy for the optimal damages, we suggested they could be understood as a way to make any predatory threat incredible.¹⁴² A lost profits recovery measured either by the reduction in the value of the business or by the difference between the "predatory" price and the competitive price for units actually sold by the

¹³⁹ There is, of course, a chance that the cartel would have broken down and the firms would have begun to compete. The predation prevents this resumption of competition, and an actuarial value could be assigned to the loss caused by the elimination of this possibility. It is not, however, significant to the argument.

¹⁴⁰ Page, *supra* note 128, at 487, argues that the reduction in the going concern value measure of damages is appropriate because "the larger the output restriction by the successful predators, the greater the expected profits of the excluded firm had it remained in the market." Page apparently would award the victim the value of the monopoly profits it would have received had it stayed in the market. But if the victim had remained, presumably the predator would not have been able to set the monopoly price. In most cases the purpose of the predation is to create monopoly profits, not to prevent the victim from reaping a share of them. And even if it proved possible to compute damages based on the victim's hypothetical share of a postexit monopoly profit, the recoveries generally would be small in relation to the predator's monopoly profit. If the victim had a 10% market share before the predation, for example, it apparently would be entitled to 10% of the monopoly profit under this approach. The predator's entitlement to keep the remainder still might leave the predatory episode profitable.

¹⁴¹ The example of predation in Part I-A *supra* also shows why lost profits are unrelated to the gains from predation. In that example, the victim had a plant with a useful life of one year that cost \$1,000 to build. It made no economic profit on sales. The reduction in going concern value or profits caused by the predation was \$1,000, the cost of the plant. (At the end of the predation, the victim was free to build a plant in some new market.) But depending on assumptions concerning the probability of success and the duration of the ensuing monopoly, the predatory episode could have been a loss to the predator or added as much as \$8,000 to the predator's profits. The lost profits award to the victim would be no more than an annoyance when the predation was successful; in other cases, the award of \$1,000 would be pointless, because the predation was unsuccessful.

¹⁴² R. POSNER & F. EASTERBROOK, *supra* note 1, at 553.

victim¹⁴³ would make the victim indifferent between leaving the market and staying in as a competitor. Because predation can succeed only by making it worthwhile for the victim to depart, the argument concludes, a lost profits measure of recovery is an adequate proxy for the optimal damages.

Alas, our argument also is unpersuasive. There would be no adequate way to restrict recoveries to those cases in which only the availability of damages prevented the predation from succeeding. Firms that never left the market, and perhaps never could have been induced to leave by any conceivable predatory campaign, still would recover damages. There could be recovery, too, even though predation is unprofitable for the predator. This damages measure therefore would produce a significant number of false positives.

Perhaps more important, this justification for lost profits damages assumes that the prospect of recovery in the future would induce the victim to stay in the market. Why should it do so? Even if there are no legal sanctions, a predator can hope to succeed only when the victim lacks reserves, adequate access to the capital markets, and long-term contracts. If the victim could obtain financing, it would outlast the predator and become the monopolist itself. The prospect of becoming a monopolist (or having a large share of the postpredation market) is more attractive than the prospect of make-whole damages based on the competitive market. If creditors will not lend at appropriate rates against the victim's more attractive postpredation prospects, they certainly will not lend against the victim's right of action. A lost profits remedy therefore makes the predatory threat incredible only when it would have been incredible anyway. Indeed, the award of lost profits damages to a "victim" that did not leave the market strongly suggests that the predation, if it existed, never could have been profitable. The remedy therefore is unavailing, yet could lead to numerous false positives.

D. The Effect of the Damages Multiplier

I have assumed in the discussion so far that a prevailing plaintiff recovers its actual damages, however they are computed. In practice, of course, antitrust recoveries are trebled. This provides the appropriate penalty if one violation in two is successfully pros-

¹⁴³ The Supreme Court hinted at such a measure in *Story Parchment Co. v. Patterson Parchment Paper Co.*, 282 U.S. 555, 561-66 (1931).

ecuted; if the proportion is greater than one in two, though, the award will be too high.¹⁴⁴ The excessive damages will in turn deter desirable conduct.

Predation is not concealable. A victim of predation is aware of any change in the market price. If the predator sends signals by conducting a demonstration in one market, or by building excess capacity, other firms will receive the signals (if not, the signalling is ineffectual and rivals will enter). This suggests that almost all predation will be detectable by its intended victims. Given the incentive provided by treble damages, it seems likely that most of those victims (as well as some firms suffering from hard competition) will sue. The availability of damages exceeding the optimal amount, when combined with private enforcement, leads to substantial waste. Private plaintiffs will invest in litigation up to the point where an additional dollar of litigation costs increases the expected judgment by just one dollar. If the available damages are twice what they should be (as is the case if all violations are detected and prosecuted), the investment in litigation—by both plaintiffs and defendants—will exceed the socially desirable level by a considerable amount.¹⁴⁵

The current rule of decision in antitrust cases (judgment on the preponderance of the evidence), coupled with a substantive rule of uncertain scope, tolerates a significant number of false positives. The greater investment in litigation, when combined with such a rule, will impose substantial costs on firms that come close to the line of predation but do not cross it. Because coming close to the line (that is, selling at marginal cost, building new plants, or reducing costs through innovation) is exactly what firms should be doing in perfect competition, the availability of excessive damages is bound to reduce, to an unknowable degree, the amount of competitive behavior. Firms can limit their exposure to liability only by increasing price, reducing output, or acting in other ways more like cartelists and less like competitors. If, as some maintain, busi-

¹⁴⁴ Why one in two rather than one in three? The optimal award starts with the computation of the monopoly overcharge and the associated deadweight loss. If the demand curve and the average cost curve of the predator are linear, the deadweight loss will be exactly half of the monopoly overcharge. See note 85 *supra* for the formula for computing deadweight loss. If the damages award is computed directly from the overcharge, ignoring the deadweight loss, then an award of three times the overcharge in half of the cases produces the proper deterrence, because the optimal award if all violations were detected would be the overcharge (X) plus the deadweight loss ($\frac{1}{2}X$).

¹⁴⁵ See Landes & Posner, *The Private Enforcement of Law*, 4 J. LEGAL STUD. 1 (1975).

nesses are risk averse, the problem is magnified, because these firms will treat the prospect of a judgment as larger than its actuarial value.

E. Eliminating Suits by Competitors

There is only one solution. We should abandon reliance on competitors' suits to enforce the rule against predation. If consumers brought suit instead, many of the problems associated with competitors' suits would be avoided. The right consumers are not those who buy during the predation and are benefited by the temporarily low price, but those who buy after predation has succeeded. Their damages are the monopoly overcharges. We could treat the successful predator like any other unlawful monopolist. A consumer could collect damages by showing that he paid a price higher than marginal cost (the overcharge), and that the seller became a monopolist by predating (which is why the monopoly is unlawful).

This remedy would deter predation by making recoupment impossible. Moreover, it would dramatically reduce the number of false positives. Because the existence of a monopoly overcharge would be an essential element of this device, it would eliminate recovery in cases where the predation failed and therefore was self-detering. It would exclude recovery in cases that easily could be confused with predation (promotional pricing, for example, or sales below cost while learning-by-doing). And it would exclude recovery by competitors whose incentive in litigating is not simply to obtain damages but also to hinder the operation of their rivals.

This remedy is not optimal. It does not properly account for the self-inflicted wounds from attempted but unsuccessful predation. In dealing with predation known *ex post* to be successful, it would be very difficult to reduce the damages to approximate the profit expected *ex ante* and so achieve the correct amount of deterrence.

This damages remedy also does not overcome the problem caused by trebling awards for nonconcealable violations. It mitigates the problem, though, because there is a substantial chance that consumers, unlike competitors, will not detect the predation that led to overcharges. Consumers might not know their suppliers' costs. If so, they could not distinguish predation from the growth of a firm that learns how to reduce the cost of production. If only ultimate consumers could bring suit, a large proportion of all predatory episodes probably would be overlooked because they would

not directly harm those consumers. But because direct purchasers such as wholesalers and manufacturers can recover the entire overcharge under *Illinois Brick Co. v. Illinois*,¹⁴⁶ the relative ignorance of ultimate consumers would not matter.¹⁴⁷ Moreover, if appropriate side payments could be arranged, the competitor-victims of predation would find it worthwhile to inform the predator's customers of the predation. Indeed, a substantial amount of notification would occur even without the prospect of side payments. The customers would notice fluctuations in the price of their supplies, during which they would be approached by the predator's competitors with offers of long-term contracts.¹⁴⁸ This process should alert the customers to the possibility of predation, and they could capitalize on their knowledge by seeking damages if the predator succeeded.

One predation case appears to adopt a variant of this approach. In *Berkey Photo, Inc. v. Eastman Kodak Co.*,¹⁴⁹ Berkey's predatory innovation suit rested in substantial part on harm supposedly done to Berkey as Kodak's customer during the period after the predatory act. The Second Circuit concluded that Berkey could recover only for harm it suffered as a result of overcharges; if the predation failed, Berkey could not recover either as a customer or as a rival manufacturer. Under the court's approach, Kodak committed no violation at all unless it used predatory innovation actually to raise prices.¹⁵⁰ This suggests that a competitor that brought suit during the period of rapid innovation could not have recovered; it could not have established that Kodak would use its greater market share to extract a monopoly profit.

As I have emphasized, a damages remedy limited to customers who pay monopoly overcharges is far from ideal. It does not take account of self-inflicted wounds. The evidence about the predatory episodes may be stale and hard to find by the time the firm at-

¹⁴⁶ 431 U.S. 720 (1977).

¹⁴⁷ See Landes & Posner, *supra* note 88, at 609-11.

¹⁴⁸ See text and notes at notes 16-19 *supra* for a discussion of why the predator's competitors would attempt to obtain long-term contracts.

¹⁴⁹ 603 F.2d 263 (2d Cir. 1979), *cert. denied*, 444 U.S. 1093 (1980).

¹⁵⁰ It is only when the monopolist, having devoured its smaller rivals, enjoys the spoils of its conquest by boosting its price to excessive levels that a purchaser "feels the adverse impact" of the violation. . . . And if the monopolist never consummates its scheme by taking this final step, the purchaser has no cause of action.

Id. at 295 (quoting *Zenith Radio Corp. v. Hazeltine Research, Inc.*, 401 U.S. 321, 339 (1971)).

tempts to collect overcharges.¹⁵¹ It would be difficult to estimate what portion of the current price was attributable to particular predatory practices.¹⁵² The list of problems could be extended. But most of these difficulties occur in mundane price-fixing cases and in litigation charging exclusionary practices other than predation. They should not be materially more troublesome in predation cases. At the same time, confining suits to injured consumers would remove from courts the principal source of false positives—competitors suing in an attempt to obtain shelter from hard competition. It would obviate the possibility of litigation in anything approaching a competitive market, or when the predator failed. The benefits seem sufficiently compelling that, if there is to be any rule against predation, it should be implemented exclusively through consumers' suits against successful predators.

III. WHY NOT PER SE LEGALITY?

The central problem with any rule against predation—if the phenomenon exists—is the great difficulty of telling predation and competition apart. No one has suggested a test for distinguishing predation from competition with anything approaching ease. Quite the contrary: predation litigation currently presents almost every complexity known to antitrust law. For example, predation cases, like merger cases, involve difficult questions of market definition. Unless the predator has or is likely to obtain a monopoly or dominant position, it cannot recoup the expenses incurred in predating. Yet markets and monopoly power are difficult to define, as several generations of litigation show. Market definitions are manipulable to a substantial degree, for none is necessarily the best definition in any given case.¹⁵³

In order to tell whether a given episode of predation is profitable rather than self-detering, the court must be able to project future monopoly profits. That cannot be done without some knowledge of the elasticity of demand for the product in question. The court must also be able to determine whether the predator could protect its position against erosion, that is, whether barriers impede entry by rival firms. In order to learn whether there is a bar-

¹⁵¹ 603 F.2d at 294-96.

¹⁵² *Id.* at 291-92, 296-98 (expressing regret at the difficulty of computing damages by measuring the difference between the unlawful portion of the price attributable to exclusionary practices and the lawful portion attributable to market share legally acquired).

¹⁵³ See Landes & Posner, *supra* note 45.

rier, the court must examine the costs of firms not yet in the market, comparing those costs with the costs of the predator.

Then, too, the court must calculate costs of the predator itself with some precision, because most approaches to detecting predation involve cost-price comparisons. It is all but impossible, however, to discover a firm's costs. The accountant's books offer little assistance in dealing with the hardest questions. Most firms make more than one product. How are the joint costs of making these products to be apportioned among them? How can a court select the economically correct rate of depreciation for equipment? Usually the accountant's rate is chosen for tax purposes rather than to reflect competitive realities. How should the court treat investment in R&D, training, or other human capital? If it treats this investment as a current expense, it runs a significant risk of condemning as predatory any expansion of output during which a firm is learning how to reduce its costs. During periods of learning the firm is adding rapidly to its human capital. If the firm treats these additions as investments, to be recovered in the future, its marginal cost could be significantly lower than if it treats all of its training or experimentation as current expenses. The same is true of advertising; if ads are treated as a current expense, the marginal cost of production is higher than if ads are treated as an investment in goodwill. This is just a beginning. The list of nice questions of cost is almost endless. Yet each of these items could make the difference between a finding of predation and a finding of no liability.

Given these complexities, it is not surprising that predation cases have been extraordinarily costly to litigate. AT&T estimates that it is spending approximately \$100 million yearly to defend itself against charges of predation.¹⁵⁴ The costs incurred by IBM in its long-running suits against all of its competitors and the United States are also staggering. The trial in the *Berkey* case lasted seven months. Zenith's predation suit against Japanese television manufacturers has been in litigation for a decade, producing (in addition to the usual warehouses full of discovered documents) mountains of briefs and more than 200 pages of opinions before trial.¹⁵⁵ The

¹⁵⁴ One private damages action against AT&T, which rested almost entirely on arguments about predation, produced a jury verdict of \$1.8 billion, after trebling. *MCI Communications Corp. v. AT&T*, appeals docketed, Nos. 80-2171, 80-2288 (7th Cir. Aug. 25, Sept. 8, 1980). Other litigation seeks similar sums; the government's suit seeks AT&T's dismemberment. Seen in this light, the defense expenditures are a bargain.

¹⁵⁵ *Zenith Radio Corp. v. Matsushita Elec. Indus. Co.*, 494 F. Supp. 1246 (E.D. Pa. 1980) (ruling on standing and antitrust injury); *Zenith Radio Corp. v. Matsushita Elec. In-*

Third Circuit has intimated that this predation litigation is so complex that a jury trial would violate the defendants' rights to due process of law.¹⁵⁶ Even "small" predation cases are complex. One antitrust specialist has estimated that the mean litigation cost of a predation case is \$30 million.¹⁵⁷

In *Illinois Brick* the Supreme Court balked at requiring courts to estimate the elasticities of supply and demand in order to determine how much of a monopoly overcharge was "passed on" from one level of production to the next. It did so because the results would not be worth the cost.¹⁵⁸ The same concern about costs informs the use of rules of per se illegality, which condemn certain practices without regard to their effects in particular cases. The Court uses per se rules when the costs of judicial inquiry necessary to separate the beneficial from the detrimental instances of a practice exceed the gain from saving the relatively rare beneficial instances.¹⁵⁹ The principal indicator of per se illegality is that "the effect . . . of the practice is to threaten the proper operation of our predominantly free market economy—that is, whether the practice facially appears to be one that would always or almost always tend to restrict competition and decrease output."¹⁶⁰ This is just another way of saying that per se rules should be used when they minimize the sum of the welfare loss from monopolization, the loss from false positives, and the costs of administering the rule.

The same considerations that support rules of per se illegality also support rules of per se legality. Although the Supreme Court has not explicitly recognized rules of per se legality, they lurk beneath the surface of several cases. It appears to be legal per se for a

dus. Co., 494 F. Supp. 1190 (E.D. Pa. 1980) (ruling on dumping allegations), *interlocutory appeal certified*, No. 80-8072 (3d Cir. May 7, 1980); *Zenith Radio Corp. v. Matsushita Elec. Indus. Co.*, 478 F. Supp. 889 (E.D. Pa. 1979) (allowing demand for jury trial), *rev'd*, 631 F.2d 1069 (3d Cir. 1980); *Zenith Radio Corp. v. Matsushita Elec. Indus. Co.*, 402 F. Supp. 244 (E.D. Pa.) (ruling on price discrimination allegations), *mandamus denied*, 521 F.2d 1399 (3d Cir. 1975).

¹⁵⁶ *Zenith Radio Corp. v. Matsushita Elec. Indus. Co.*, 631 F.2d 1069, 1084-86 (3d Cir. 1980). See Jorde, *The Seventh Amendment Right to Jury Trial of Antitrust Issues*, 69 CALIF. L. REV. 1 (1981), for additional evidence on the complexity of the issues in predation cases.

¹⁵⁷ Joshua Greenberg, in STRATEGIC PREDATION AND ANTITRUST ANALYSIS, *supra* note 1. In the same conference, I offered the more modest estimate of \$3 million for an ordinary case.

¹⁵⁸ *Illinois Brick Co. v. Illinois*, 431 U.S. 720, 741-45 (1977).

¹⁵⁹ See, e.g., *Catalano, Inc. v. Target Sales, Inc.*, 446 U.S. 643, 646-49 (1980); *Continental T.V., Inc. v. GTE Sylvania Inc.*, 433 U.S. 36, 50 n.16 (1977).

¹⁶⁰ *Broadcast Music, Inc. v. Columbia Broadcasting Sys., Inc.*, 441 U.S. 1, 19-20 (1979).

firm that discovers how to reduce the costs of production to grow, even to become a monopolist, as a result of that discovery.¹⁶¹ Even though horizontal mergers yielding a survivor larger than a certain market share are unlawful, it appears to be lawful per se for a firm to achieve that share (and more) by internal growth.¹⁶² It is lawful per se for a firm to "fix" prices internally, binding its own agents and employees, even though every firm is a "contract or combination" among many actors.¹⁶³ It is lawful per se for a firm to refuse to deal with customers that will not adhere to resale price and other policies of the seller.¹⁶⁴ Every one of these practices *could* be inefficient in some instances, but the courts rightly decline to try to find those few instances. If a practice "appears to be one that would always or almost always [increase] competition and [expand] output," and if case-by-case adjudication entails substantial costs and creates a significant risk of penalizing desirable hard competition, the practice should be lawful per se. Such a rule minimizes total social costs.

Conduct that might be predatory *always* involves lower prices, greater output, innovation, or other features that usually increase consumers' welfare. Any attempt to administer a rule against predation entails a significant risk of condemning the outcome of hard competition. The costs of litigating predation cases are staggering; no more complex cases could be imagined. And although a given price reduction or addition to plant *could* be predatory, it almost certainly is not. Similarly, price fixing or territorial allocations *could* be beneficial, but they almost certainly are not.¹⁶⁵ If there is

¹⁶¹ *United States v. Grinnell Corp.*, 384 U.S. 563, 570-71 (1966); *Berkey Photo, Inc. v. Eastman Kodak Co.*, 603 F.2d 263, 273-75, 286-88 (2d Cir. 1979), *cert. denied*, 444 U.S. 1093 (1980); *E.I. du Pont de Nemours & Co.*, 987 ANTITRUST & TRADE REG. REP. (BNA) F-1 (F.T.C. Oct. 30, 1980).

¹⁶² This is the point of the Court's oft-repeated admonition in merger cases that internal growth would not have been unlawful.

¹⁶³ *See, e.g., Broadcast Music, Inc. v. Columbia Broadcasting Sys., Inc.*, 441 U.S. 1, 9 (1979), *approving* *United States v. Addyston Pipe & Steel Co.*, 85 F. 271, 280 (6th Cir. 1898) (restraints "ancillary" to productive economic organization are lawful), *aff'd*, 175 U.S. 211 (1899).

¹⁶⁴ *United States v. Colgate & Co.*, 250 U.S. 300 (1919). *Colgate* has been modified when the seller obtains third-party cooperation in policing its policies or when a refusal to deal appears to be part of a broader campaign of monopolization, but at least within the limits established over the years the rule applies per se. *See United States v. Parke, Davis & Co.*, 362 U.S. 29 (1960); *Eastman Kodak Co. v. Southern Photo Materials Co.*, 273 U.S. 359 (1927); *Official Airline Guides, Inc. v. FTC*, 630 F.2d 920 (2d Cir. 1980), *cert. denied*, 49 U.S.L.W. 3617 (U.S. Feb. 23, 1981) (No. 80-961).

¹⁶⁵ *See generally* R. POSNER & F. EASTERBROOK, *supra* note 1, at 114-18. Price fixing reduces the costs buyers must incur in shopping. There is no need to hunt for the lowest

any room in antitrust law for rules of per se legality, one should be created to encompass predatory conduct.¹⁶⁶ The antitrust offense of predation should be forgotten.

price. If price were fixed only slightly above the competitive level, this saving in information costs could be beneficial. Similarly, territorial or customer allocations allow producers to reduce their sales staffs, and they may make orders flow more regularly, thus allowing sellers to plan production more efficiently. These cost savings conceivably could exceed the dead-weight loss of monopolization. See Dewey, *Information, Entry, and Welfare: The Case for Collusion*, 69 AM. ECON. REV. 587 (1979).

¹⁶⁶ Predation is not the only candidate for per se legality. After *Continental T.V., Inc. v. GTE Sylvania Inc.*, 433 U.S. 36 (1977), one logical step is per se legality for restricted distribution and vertical integration. See Bork, *Vertical Restraints: Schwinn Overruled*, 1977 SUP. CT. REV. 171; Posner, *The Next Step in Antitrust Treatment of Restricted Distribution: Per Se Legality*, 48 U. CHI. L. REV. 6 (1981). Another is per se legality for business torts. See Note, *Antitrust Treatment of Competitive Torts: An Argument for a Rule of Per Se Legality Under the Sherman Act*, 58 TEX. L. REV. 415 (1980).